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Board Eyes Seaborne Mail As Base Cargo for Air Service

Speculation on post-war air-carrier service is brought down to earth in a survey of United States overseas mail by the Civil Aeronautics Board's Research and Analysis Division.

The expansion of air transportation abroad and the routes taken will largely depend on the amount of seaborne first-class mail that is diverted to air, the survey indicates.

Mail Reflects Traffic

Maintaining that the interchange of mail lies at the root of all traffic systems, the report makes the point that the pattern of general air traffic can be expected to correspond roughly to the pattern of mail flow. Transportation of first-class mail is traditionally a matter of public concern, and it offers an established means of Government support to commercial services. Further, it is subject to diversion to the air either by adjustment of postal rates or other Government action.

In a supposition that all first-class surface mail be diverted to the air, the survey estimated a minimum need of 142 planes, covering a daily mileage of 174,000, and carrying an average 512 pounds per flight, and a maximum of 235 planes traveling 288,200 miles a day and carrying 331 pounds.

World Basis

The maximum estimate is based on one daily round-trip service to all countries in the world to which 500 pounds of first-class mail would be dispatched daily from the United States and additional schedules to countries getting over 500 pounds. The minimum estimate is based on daily round-trip service to all Caribbean and Latin-American areas presently served by American flag carriers and to all other countries (except South Africa, Kenya, and India) to which the daily mail poundage would range from 10 to 1,000, with additional schedules provided for mail in excess of 1,000 pounds.

Both estimates assume an average utilization of 450,000 miles per year per unit for total fleet of active and reserve aircraft; routes via the most economical distances between United States sea terminals and overseas way-stations and terminals; 100 percent schedule completion, and no allowance for seasonal variation or irregularity in traffic volume.

Most of the 70 million pounds of mail sent to foreign countries by sea consists of photographs (58.2 percent). Next comes parcel post (35.2 percent), and lastly letters (6.6 percent). The mail total is based on a 20-year average up to and including 1942. A total of $2,043,000 a year is paid to sea transport for mail. (The average mail rate of payment is 20 cents a pound for letters, 2.7 for prints, and 2.6 for parcel post.)

Cost a Factor

How soon the overseas letter might become air mail would depend in large part on a downward adjustment of air mail rates, the report points out, since postal charges for ordinary seaborne mail are very low. To send mail by sea from the United States to foreign countries costs from 3 to 5 cents for the first ounce depending on destination, plus 3 cents for each additional ounce or fraction.

The following charges are made for United States air mail on routes operated to foreign countries: Rates to the West Indies are from 10 to 25 cents a half ounce. To Central America, they are 12 to 20 cents a half ounce; to South America, 25 to 40 cents; to Europe, 30 cents; to Africa, 30 to 60 cents; and to Asia, 70 cents a half ounce.

In comparison the charges for overseas air mail service from England or France to Africa range from 3 to 30 cents a half ounce plus 3 cents ordinary postage; to Asia, from 20 to 50 cents, plus 3–5 cents, and Australasia, from 29 to 40 cents plus 3–5 cents.

Time a Factor

If alternate sea transportation were to remain available and a price differential continued to exist between shipment by air and by sea, the amount of the mail which would be sent by air would be governed by the preference of the mailer after consideration of relative cost and time advantages.

(*See Seaborne Mail, page 128*)

Pages of Facts

Air carrier operations receive a thorough statistical analysis in this issue of the Journal. Tables beginning on page 135 present complete data on operations for the period January–July 1943 as compared with the same period in 1942 and show the results, as well as the methods of analysis, of domestic and overseas airline accidents for the period January 1938 through June 1943. Data for the accident analysis were obtained from the official files of the Civil Aeronautics Board's Safety Bureau.

A slide-rule picture of the safety of air transportation is statistically drawn in the 5½-year breakdown of miles flown per fatality, which appears under the heading "Airline Accident Statistics." The accident statistics, on a 5-year period, were last published in volume 2, No. 12, of the Journal.

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Aviation Insurance Discussed By General Counsel Webb Shadle

Uniform liability will be established for air carriers but if insurance companies can give adequate coverage to carriers, hold themselves to reasonable profits, and give efficient service the Government will not enter the aviation insurance business, according to Webb Shadle, General Counsel of the CAA.

Shadle made the above observation in a discussion of pending legislation as it affects aviation insurance at a recent meeting of the American Bar Association in Chicago.

Legal History

Shadle reviewed the legal history of aviation insurance and named some of the forces which are influencing pending or proposed insurance legislation. These, he stated, were the safety record of United States air carriers, the State Law for Aeronautics of 1922, precedent-setting decisions of international conventions held several years ago at Warsaw and Rome, and studies and reports made by the American Bar Association, the Air Transport Association, and the Civil Aeronautics Board.

In discussing the question of liability limitation Shadle explained that the unsettled jurisdiction of the Federal Government in the matter of use of intrastate airspace is a factor affecting passage by Congress of laws to govern liability. On this question he pointed out, however, that expediency has intervened in the consideration of whether a landowner controls the airspace above his property and he suggested that the same may hold true in determining jurisdiction over all airspace.

Owner Liable

In the matter of the state's position on liability he pointed out that the State Law for Aeronautics of 1922 (the broadest effort yet at uniformity), adopted in some 20 states and Hawaii, does not cover liability of aircraft owners or operators to passengers or property carried. This law makes the owner of every aircraft absolutely liable for injuries to persons or property on the land or water beneath, caused by the ascent, descent, or flight of the aircraft, or the dropping or falling of any object therefrom, whether such owner was negligent or not, unless the injury is caused in whole or in part by the negligence of the person injured, or of the owner or bailee of the property injured.

Shadle concluded that two elements appear to be essential to a workable national program. One is uniformity of responsibility of the air carrier and the other is a limitation of that responsibility to be achieved through Federal legislation.

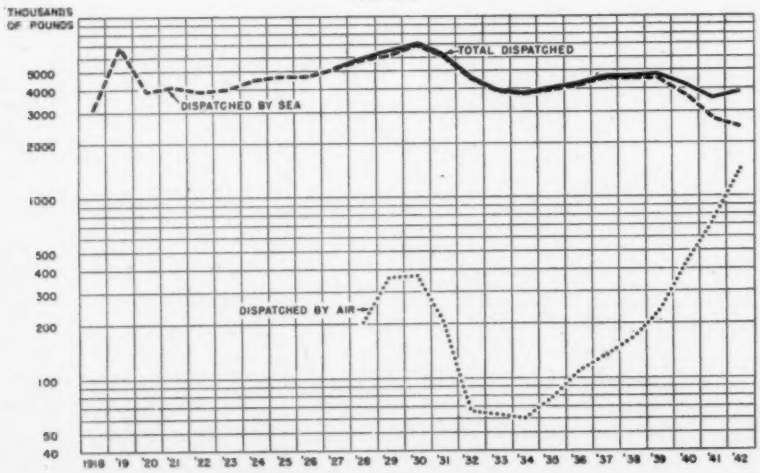
Seaborne Mail

(Continued from page 127)

Since the air services which would be furnished under either maximum or minimum diversion of present seaborne mail would provide substantial capacity for passengers and property, and present additional factors for economic consideration, the Civil Aeronautics Board is making a study of overseas passenger traffic to complement the mail study.

The Post Office Department's Division of International Postal Service supplied the necessary data and collaborated with the Board's staff in preparing the mail report.

AIR MAIL AND LETTER MAIL DISPATCHED BY SEA
1918 - 1942



SOURCE: BASIC DATA SUPPLIED BY POST OFFICE DEPARTMENT
NOTE: MAIL TO HAWAII IS EXCLUDED

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CIVIL AERONAUTICS JOURNAL

Contents

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Power Plant Fire Gremlin Grounded Through CAA Study

Coincident with National Fire Prevention Week the CAA has announced the issuance of a report explaining measures to be taken in achieving safety from fires in the engine compartments of aircraft.

Entitled "Aircraft Power Plant Fire Protection," the report covers design and layout of systems for both preventing and putting out fires which might result from escape of gas or oil, or from collection of inflammable vapors. The report is confined to means of combatting the fire hazard in engine compartments and in the neighborhoods of auxiliary power plants and combustion heaters because in these locations sources of ignition and inflammable materials are in close proximity. Diagrams accompanying the report show satisfactory methods of installing protective equipment for these locations.

Recommendations included in the report are based upon extensive research and nearly 3,000 actual fire tests on radial air-cooled engines.

Free copies of the report, issued as "Flight Engineering Report No. 34," are available for the industry and the armed forces and copies may be obtained upon request from the Publications and Statistics Division, CAA, Washington.

U. S. War Transport Efficient, Says Stern, New Information Head

The efficiency of United States war transport services, the ability of the fliers, a large number of whom are CAA trained, and the equipment and service of American-built airports on the war fronts surpass any other nation, Lt. Col. Ben Stern, recently appointed CAA Director of Information and Statistics, reported as he entered upon duty in his new assignment.

Stern, as a lieutenant colonel in the Marine Corps Reserve, made his personal acquaintance with the American and Allied air services through thousands of miles of air travel while on special detail to the Co-ordinator of Information and later to the Office of War Information as special field representative.

Special assignments took him across the length and breadth of Africa, into Egypt, the Middle East, the Balkans, India, China, and the Pacific area. He flew with the South African Air Force over Bengasi and Tobruk on bombing missions, and with the British Overseas Airways Co., to India. From Karachi to Bombay, India, he flew on the Tata Lines, an all-Indian company. In the Pacific area, he flew on Pan American Airways, Navy Transport PBM 3's and the Australian National Airways.

Called to active duty with the Marine Corps as a captain in the reserve 9 days after Pearl Harbor, Lieutenant Colonel Stern was placed on the inactive list June 16 when he became consultant to Elmer Davis at OWI.

Previously he served as secretary to United States Senator Van Nuys and as clerk of the Senate committee on the Judiciary, and at the same time wrote for various publications. Before coming to Washington he was with the Indianapolis Times as political editor, the Memphis Press Scimitar, and International News Service, and other newspapers and agencies.

7 Aviation Mechanics Given Merit Awards

Seven aviation mechanics chosen by the Department of Commerce to receive awards of merit for outstanding work as "soldiers of production" have been selected from among 3,000 mechanics engaged in maintenance of planes used in the CAA War Training Service program, which is currently training more than 27,000 pilots for the Army and Navy.

Winners are Edward Church, Jennings Brothers Air Service, Fitchburg, Mass.; Clarence M. Webb, J. Lewis Hilbert, Johnson City, Tenn.; Donald Griffith, Queen City Flying Service, Cincinnati, Ohio; Sam Millard, Spartan School of Aeronautics, Tulsa, Okla.; Deane C. Gilmore, Graham Flying Service, Sioux City, Iowa; John H. Hawkins, Pathfinder Flying Service, Ltd., Carson City, Nev.; and Harold Hahn, Wallace Air Service, Spokane, Wash.

"Danger Ahead" Tips Given Pilots By Flight Communications Service

No pilot should be able to blame an accident on lack of information, now that CAA requires the aircraft communicator to take the initiative in transmitting complete and up-to-date information on flying conditions.

The average pilot isn't an alarmist. As long as everything looks all right around him, he may see no need for radio contact. Blissfully cruising along, he may be flying into a storm, the landing field may have washed out ahead of him, or the radio aid facilities may be out of commission. Usually he doesn't suspect trouble until he's in it and has to depend on his wits to get him out.

To give the pilot advance warning of changed conditions, communicators are now being instructed to contact the pilot and inform him of bad weather or other dangerous conditions which have developed since he took off.

A pilot, for instance, may run into a thunderstorm that wasn't in the forecast. It may look like a local storm to him, and he may decide to take a chance and try to get around it. The communicator, with all the weather reports coming in, isn't guessing. The reports tell him thunderstorms are developing all around the area. He knows that the odds in getting around the area are against the pilot, and that he'll probably end up lost and out of gas. Under the present system, the communicator makes every effort to contact the pilot, and warn him of the exact conditions facing him while he still has time to reach an airport.

This is the job the communicators in almost 400 airway communications stations of the country have been instructed to perform. They watch the weather conditions, landing and radio facilities and other safety factors within a certain radius (usually around 300 miles) of each station, and keep track, as far as possible, of all flights passing through their particular contact zone. In constant touch with the weather and other conditions tapped in by teletype from surrounding information points, forecasts from the United States Weather Bureau, and reports from airmen who have recently completed flights, the communicator has vital knowledge he can give directly to the pilot.

The flight communications service is being directed toward the selection of the information that will do the pilot the most good. The communicator must be able to talk the pilot's language, know what information to give, and predict what the pilot will do with it.

The flight communications service, in practice since July, has had effective results. During the first two months, the service provided 13,226 flights, Army, Navy, Coast Guard and civil, with one or more items of essential information. In order to avoid the hazardous conditions called to their attention, 1,093 of these pilots changed their destinations. A substantial number of others made changes in their routes of flight for the same purpose. No change in destination or route was suggested. The service simply furnished the pilots with essential information about flying conditions.

Preflight Films

For the benefit of colleges, vocational schools, or high schools equipped to use 16-mm. sound films as an aid in aeronautics instruction, the Journal is printing the following list of preflight training films. These films, released by the U. S. Office of Education, were produced by the Army and Navy for aviation trainees. The films may either be rented or bought. Information concerning prices, subject matter and shipment may be obtained by writing "The Princeton Film Center," Princeton, N. J.

Title	Footage
Aircraft engines:	
Types, Mechanisms and Oiling Systems	1,300
Elements of Electricity as Applied to Ignition Systems	1,000
Carburetion	1,325
Servicing the Aviation Spark Plug	875
Aircraft Hydraulic Systems—Part I—BC–1 Airplane	550
Airplane Structures:	
Part I—Structural units—materials and loads for which designed	275
Part II—Wing Construction	375
Part III—Fuselage Construction	300
Part IV—Control Surfaces	375
Part V—Alighting Gear	350
Part VI—Manufacturing Methods	925
Part VII—Static Testing	450
Propellers:	
Part I—Principles and Types	625
Part VII—Hamilton Hydromatic Propeller, theory and operations	600
Hydraulic Brakes:	
Part I—Principles of Operation	725
Part II—Types, Construction and Action	1,075
Weather; Theory and Structures of Storms:	
Part I—Primary Circulation	675
Part II—Development and Characteristics of Atmospheric waves	525
Celestial Navigation:	
Part I—Introduction and Location of Celestial Points	650
Part II—Principles of Celestial Navigation—Position Finding on the Earth	525
The Earth	600
Charts	675
Aerial Navigation:	
Part I—Maps and Compass	500
Part IV—Radio Aids	1,075
Part V—Airways Flying	1,075
Aerodynamics:	
Air flow	650
Forces Acting on an Air Foil	975
Radio Antennas—The Creation and Behavior of Radio Waves	425
The WEFT System of Aircraft Identification, basic characteristics	500
Identification of Air and Surface Vessels, special characteristics	400
Nautical Astronomy	850

Average Man Air Service

By C. I. Stanton, Administrator of Civil Aeronautics

The growth of the aviation industry, during the past three years particularly, stands as one of the most phenomenal facts in all our industrial history. But proof of the fact that this industry is not going to rest on its laurels are the hearings which the Civil Aeronautics Board recently called to explore the almost undeveloped fields of air transport—the fields of local, feeder, and pick-up services.

We long have had an unrivaled system of trunk-line air services spanning the country from coast to coast, from the Great Lakes to the Gulf. But if air transport is going to do the job it should, we shall need more than trunk-line services. Aviation should be brought to every sizable community that has need of it.

Passenger Market

The market for short-distance travel is one which should receive a great deal of attention. There is no alternative to the development of this market as a means of expanding air transport.

In order adequately to plan for short-distance expansion, the CAA has made studies which reveal that in the Northeastern quadrant of the United States (the region north of the Ohio River and east of the Mississippi) the optimum distance for air travel lies somewhere between 150 and 200 miles as measured by rail. The optimum probably lies closer to 200 miles than 150, and it is significant that our basis of measurement has to be the distance in terms of surface transport.

Our studies have revealed that the shorter the trip, the greater the volume of traffic and the greater the number of passenger miles, down to a very short distance. Common everyday experience confirms this.

To illustrate the relative magnitude of passenger traffic as the distance between stops is decreased let us assume that two terminal cities are 600 miles apart by *rail* and that between them lie five other cities spaced 100 *rail* miles apart. Let us further assume that the terminal cities are of the same size (100,000 population) and that the intermediate cities are all of equal size (25,000 population), the latter being only one-fourth the size of the former.

In this case traffic will increase rapidly as stops are added. For example, the addition of a stop midway between terminals will increase traffic by an amount equal to 70 percent of the traffic between the terminal cities alone. If two stops are added at 200 rail-mile intervals instead of one midway, the increase in traffic will be about 160 percent. Assuming the relation between distance and passengers holds good down to 100 rail miles, the addition of three other possible intermediate stops would much more than double the number of passenger miles which would be flown if the intervals were 200 miles. In fact, the traffic with stops every 100 *rail* miles would be over six times the traffic between the two terminals alone.

Short Hop Economics

Arguments will be advanced that short-distance air service costs more than long-distance service; that as length of the hop decreases, unit costs increase, with the result that rising costs prohibit short-distance air travel. It may be that a careful analysis has never been made of the many interesting factors involved in the relation of unit costs to length of hop. Perhaps the answer will not be available until the results of actual operations are known. Very serious attention should be given to this phase of the problem.

As the length of hop goes down, the number of passengers to be carried increases. For example, for the same total of passenger miles six times as many passengers have to be ticketed, loaded, and unloaded for 100-mile trips as for 600-mile trips. Obviously, one should expect some cost increases as a consequence. But it is hard to believe that any unit cost increases on this account will be substantial enough to prohibit short-distance air service.

The main cost difficulties appear to revolve around the efficiency of the design of an aircraft for the different types of service described, and are influenced by the location and design of the airports involved. Probably what is needed is a plane designed specifically for short-range operation. Such a plane would perhaps have characteristics as follows: Optimum efficiency at low altitudes; short range—perhaps 300 miles, inclusive of reserve fuel; short take-off and landing runs; high maneuverability on the ground; lower cruising speeds than for long-range planes; smaller size than long-range planes—perhaps in some cases with pay load of as little as 5000 pounds, depending on the volume of traffic involved, very light weight, with non-de-luxe passenger equipment; and adaptability to cross-wind landings.

In considering the use of specialized equipment there is a common tendency to ignore, partially or completely, the effect of mass production upon unit costs. In the matter of volume production the CAA can speak from experience. It is proud of its cost record for the Federal airways. Costs in 1941 were less than half the 1936 costs; not total costs, which went up, but costs per unit of air-line traffic on the airways. A very large share of that can be attributed simply to the fact that the traffic carried by the airlines was almost four times as great.

The ideal service for a traveler would be one of door-to-door delivery, so to speak. As a practical matter, this ideal can hardly be approached. But air transport still seems far removed from even a reasonable compromise between the expedient and the ideal. Airports are generally some miles from the center of the city. Contrast this with the usual situation of railroad stations!

There are some who pin their hopes on the helicopter to bring air transport services close to the door-to-door ideal. However, the total lift of any helicopter now in the planning stage is not very large. Until a large craft—something approaching the size of conventional transport planes—can be put into service, it does not seem to offer a practical solution to the problem of mass transport over short distances. Nevertheless, the importance of the helicopter should not be minimized. Perfected in sizes ranging from a two-place machine to a machine with many times that capacity it is capable of revolutionizing aviation. Meantime, adaptation of the conventional plane and airports to the mass short-distance market is an immediate necessity.

Every effort should be made to bring airports closer to cities. In addition, it seems that we should begin to think and plan for multiple air stations in our cities. Service to these air stations should not be patterned after service to multiple railroad stations within a city. Rather, to and from each air station in one city there should be direct service to and from each air station in another city.

It seems apparent that development of very efficient short-distance service is necessary for intensive development of long-distance travel. The volume of traffic involved in long-distance travel is substantial. To obtain the maximum possible development it requires the development of complementary short-distance services.

On the basis of the foregoing we may conclude that, from the revenue passenger point of view, expansion of our domestic air transport system requires many new stops to be added; a manyfold increase in short-distance services; and, intensive development of the market for mass short-distance travel between large metropolitan populations, perhaps by means of multiple airports at each city.

Mail, Express Market

While the short-distance travel market holds forth much promise, as great or even greater expansion is possible in the carrying of mail, express, and freight.

One very important method of handling mail and other articles has not been and perhaps for some time will not be available for passenger traffic. This is the pick-up method which has certain obvious advantages. It eliminates the time lost in making stops and the necessity for airports at many places. Pick-up operations may, however, only represent a transitional stage pending the development of helicopter designs suitable for comparable service.

With regard to mail service, every effort should be made to permit full advantage of the development of air transport to accrue to the nation. In place of transmitting only the most urgent letters by air at a surcharge, it

(*See Average Man, page 145*)

New Aviation Mechanic Classes Provided in Proposed Regulation

Because the aircraft mechanic certificate is the same type as that issued in 1926 for equipment flown in those days, the CAA and the CAB are proposing a rewrite of "Mechanics Certificates" (part 24 of the civil air regulations) to break the field down into groups for the beginner, the experienced mechanic, and the specialist. Present-day aircraft are too complex to be covered by one certificate of a mechanic's ability. Likewise, it is too much to ask a mechanic to qualify in the whole field, CAA believes.

Asks for Comments

Believing that the basis for certification of aircraft and engine mechanics should be changed now rather than immediately after the war when thousands of returning servicemen will be seeking employment, copies of the proposed rewrite have been circulated throughout the trade for comments. The number of comments received has been small, and more discussion of the problem and the manner in which it should be solved has been asked by Charles I. Stanton, CAA Administrator.

"This is a part of the decentralization plan which the CAA has been pursuing for several years, and it is also a continuation of our policy of seeking completely democratic discussion before any rules are made which will affect the aviation industry," Stanton has said.

Break Down Jobs

The new regulation would break the mechanic's certificate down into grades for aircraft technicians, aircraft engine technicians, and specialist technicians, some of them with multiple ratings.

The three ratings for the "aircraft technician," (1) maintenance and service; (2) repair and overhaul of composite aircraft structures, and (3) repair and overhaul of metal aircraft structures, recognize the wide difference between composite and all-metal aircraft, and also the fact that the technician may be qualified on one or the other but not on both, due to the specialization which is current today.

Engine Technician

The aircraft engine presents complications of structure and function. For that reason, the CAA believes that aircraft engine technicians should have the following service ratings: (1) maintenance and service of unsupercharged engines; (2) repair and overhaul of unsupercharged engines; (3) maintenance and service of supercharged engines; (4) repair and service of supercharged engines. If a man holds a rating on a supercharged engine, it will also include the rating on an unsupercharged engine. Here again, the great number of smaller engines to be serviced and repaired will probably result in a large number of mechanics who will have no desire for the higher rating and should therefore not have to meet the more difficult standards.

The CAA believes there is now enough work to justify the following five types of specialist technician certificates: (1) propellers; (2) instruments; (3) radio; (4) carburetion; (5) ignition.

The CAA would further grade aircraft and aircraft engine technicians according to their skill and experience as mechanic, senior mechanic, and master of maintenance.

Inspection Privilege

The mechanic grade would convey all the privileges now held by the holders of the present mechanic certificates.

The senior mechanic grade in addition would give the privilege of inspection and return to service of any aircraft on which work has been done, without the necessity of inspection by a CAA representative.

The master of maintenance grade would be issued to men of long experience who hold aircraft and aircraft engine technician certificates, and who have exhibited outstanding skill and responsibility. These men could inspect aircraft for renewal or reinstatement of airworthiness certificates, and they could exercise the duties and responsibilities of CAA inspectors, and of the few men now called "aircraft inspection representatives." There also would be grades for the specialist technicians similar to those for mechanics.

In aiming to delegate inspection duties, CAA foresees the time when the increased number of aircraft will make it physically impossible for CAA inspectors to check on major repair jobs. Provisions for such inspection are proposed in the rewrite so that the airplane owner would not be unduly inconvenienced.

CAB Asks For Ideas On Overseas Routes

In a recent statement the Civil Aeronautics Board has invited suggestions as to international air transport routes which are likely to be important to the United States in the post-war period. Such suggestions, according to the Board, should be in writing and will be of maximum value if they are accompanied by supporting analyses and data.

"This study is informal and will be used as a basis for formal consideration of applications for certificates of public convenience and necessity involving international services," the Board said. "The study does not involve any consideration of the identity of the particular carrier or carriers by whom such services should be operated, but is directed solely to the question of the routes which would be desirable."

Aviation M. D.'s To Hold Nationwide Meeting This Month

Medical men from the Army and Navy air services, the airline companies, and the Civil Aeronautics Administration will attend a national aviation medical convention at Cincinnati, October 26–27.

Among those presenting papers at the convention will be Dr. W. R. Stovall, head of the CAA Aviation Medical Division and Dr. A. J. Herbolsheimer, assistant chief.

Dr. Stovall's paper, "Trend in Civil Aviation Medicine," will emphasize the basic differences between civil and military aviation medicine: the military can select the best person for the job and reject all others, while civil aviation must recognize the right of all persons to use the air as a transportation medium and must issue medical certification to any individual who can fly safely. A civilian may not be able to meet the minimum physical requirements, but if he has compensated for his deficiencies and can demonstrate in actuality his ability to "fly safely" he is still entitled to medical certification.

Of 140,397 pilot medical examination reports filed by the CAA during the last fiscal year 2708 denials were entered by reason of examinees not having met minimum standards. Of those denied 852 were able to obtain waivers after proving that they were able to either overcome or compensate for defects. Thus better than 30 percent of those unable to pass exams were able to obtain waivers so that they could fly. About 1.3 percent of those who take exams, therefore, fail to qualify physically for the flying privilege.

Dr. Herbolsheimer's paper, "The Role of the Extra-ocular Muscles in the Aviation Medical Examination," will explain the type of examination to be given to determine whether there is properly balanced vision.

One afternoon of the convention program will be devoted to a CAA forum where CAA field examiners will get a chance to discuss problems and ask questions. About 300 CAA examiners are expected to attend.

Examination Guide Now Available

A "Pilot Written Examinations Guidebook" has just been issued by the Civil Aeronautics Administration and copies of it are available free upon request from the Publications and Statistics Division, Washington.

The Civil Aeronautics Act of 1938 requires that all persons who apply for airmen certificates or ratings must demonstrate their qualifications by a satisfactory performance on both a written examination and a practical examination. The guidebook deals only with the written examination. It has been prepared so that each applicant may know what is expected of him, and so that he may become familiar with the form of the examination before he takes it.

Crop Dusting Plane Stalls at 150 Feet

Edwin Dwight Abel was fatally injured in an accident which occurred 1 mile west of the Municipal Airport, Mission, Tex., March 26, 1943. Abel held a commercial pilot certificate with a single-engine land, 0–330 hp. rating and had accumulated about 533 hours of solo flight time. The aircraft, a Travel Air 4000, was destroyed by impact and fire.

Abel, engaged in dusting a grapefruit grove, was flying up and down the lines of trees, north and south, at a low altitude. A power line running through the grove in an east-west direction made it necessary for the pilot to zoom over the wires on each swath and nose down again to dusting level immediately on the other side. After the pilot had finished dusting the grove from north to south, it was necessary for him to make a final flight along the line of poles on the windward side so that the sulphur dust would reach the trees directly under the power line. This flight was made from east to west. When the pilot arrived at the extreme west end of the grove, he pulled the aircraft up to an altitude of about 150 feet in a right climbing turn and then started to circle to the left. During this left turn the aircraft was observed to slip from a partially stalled position. The slip continued until the left wing struck a grapefruit tree, after which the aircraft hit the ground with considerable force, cartwheeled and immediately burst into flames.

Examination of the wreckage revealed no indication of failure of any part of the aircraft prior to impact. The weather was clear with a 5 m. p. h. NNW wind. Evidence indicated that the engine was operating normally and that considerable power was being developed at the time of impact.

Probable cause.—Stall at an altitude too low to effect recovery.

Contributing factor.—Carelessness.

Fire in Flight Fatal to Two

Instructor Lambro Spero Carros and his student, Benjamin Franklin Gentry, were fatally injured in an accident which occurred about 2 miles south of Stovall Airport, Shreveport, La., November 8, 1942. Carros held a commercial pilot certificate with single-engine, land, 0–330 hp., and flight instructor ratings. He had accumulated approximately 600 hours of solo flying time. Gentry, a student pilot, had acquired about 70 hours of solo and check time since June 1942. The aircraft, a Porterfield CP–65, was destroyed by impact and fire.

Instructor Carros and Student Gentry took off from Stovall Airport for the purpose of checking Gentry's flying technique. Carros occupied the front seat. About 10 minutes later the aircraft was observed about 2 miles south of the airport, headed in a southerly direction, at an altitude of approximately 450 feet. Witnesses stated that the engine seemed to be operating normally until it was apparently throttled, at which time a shiny object fell from the plane. Immediately thereafter the aircraft started a left turn, and flames were observed coming from the front portion of the fuselage, quickly spreading over the entire plane. The aircraft continued in a left spiral and, at an altitude described by witnesses as approximately 200 feet the student jumped out. The plane then went into a dive and crashed nose first some 80 feet north of where the student struck the ground. It bounced about 20 feet, and was consumed by flames at the point of the second impact.

The aircraft was so completely destroyed that it was impossible to determine the origin of the fire. It was reported that the fuel tank overflowed when it was filled just prior to this flight, which would have permitted the surplus gasoline to accumulate in the bottom of the fuselage. This gasoline may have become ignited from a lighted cigarette, since Carros reportedly smoked on almost every flight. The aircraft was equipped with a fire extinguisher which appeared to have been used in an attempt to extinguish the fire. The object seen falling from the plane was later identified as the left front window. This was apparently pushed out by one of the men when the fire first started. Neither Carros nor Gentry wore a parachute.

Probable cause.—Fire in the air, from causes not determined.

Frost Coated Plane Crashes in Take-off

Albert Thomas Mitten and Ralph W. Swanson were fatally injured in an accident which occurred near the southwest boundary of the Municipal Airport, Billings, Mont., November 21, 1942. Mitten held a commercial pilot certificate with single and multi-engine 785–2655 hp. land ratings. Although his log books could not be located for examination, he had apparently flown in excess of 4,000 hours. Swanson was not certificated as an airman. The aircraft, a 14-year old Ford 4–AT–B, was demolished. It was registered in the name of the Atlantic Airmotive Corporation but was in process of transfer to the United States Army Engineer Corps.

Pilot Mitten was employed by the Atlantic Airmotive Corporation to ferry the aircraft from Roosevelt Field, Long Island, N. Y., to Edmonton, Canada. His last stop en route was Billings, where the aircraft was staked out overnight. At the time of take-off from Billings the temperature was between 15° and 20° above zero and the aircraft was covered with a heavy coating of frost. Mitten received clearance from Billings to Edmonton, via Great Falls, Mont. Following a brief warm-up of the engines and without removing the frost from the plane, the pilot took off into a quartering wind of 5 m.p.h. After a run of from 3,500 to 4,000 feet, the plane became temporarily airborne and reached an altitude of about 20 feet. Near the end of the runway it began to settle and the pilot started a shallow turn to the left. The tail wheel struck the airport boundary fence, deflecting the nose downward, and the plane bounded forward across the highway adjacent to the airport, struck a tree, slid over the rimrock and crashed to the ground approximately 100 feet below.

Examination of the wreckage revealed no indication of failure of any part of the aircraft prior to impact. It is apparent that the reduced lift, caused by the heavy coating of frost, and the reduced power, resulting from only partially warmed engines, resulted in inability of the pilot to effect a successful take-off.

Probable cause.—Poor judgment of pilot in attempting to take-off in aircraft heavily coated with frost and with only partially warmed engines.

Mid-Air Collision Kills Student Pilot

A mid-air collision which occurred near Felts Field, Spokane, Wash., on December 2, 1942, resulted in fatal injury to Thomas Henry Lauer, a solo student, and minor injuries to Instructor Donald Wayne Palmer. Palmer's student, Stephen Carl Devenish, escaped injury. Lauer held a student pilot certificate, and had accumulated approximately 17 hours of flight time, 2½ of which were solo. The aircraft, a Luscombe 8A, was demolished. Instructor Palmer held a commercial pilot certificate with single-engine 0–330 hp. land and flight instructor ratings. He had logged about 181 hours of flying time, but had had only 1½ hours as an instructor. This was his second student instruction flight. Devenish held a student pilot certificate and had logged a total of 7 hours dual instruction. The aircraft, a Piper J3F–60, was extensively damaged.

Lauer, flying solo in the Luscombe, took off from Felts Field. He practiced maneuvers and then re-entered the traffic pattern, circled the field to the left at about 800 feet, and headed almost due east on the downwind leg of the traffic pattern. Meanwhile, Instructor Palmer and Student Devenish had been practicing landings in the Piper, and

(*See Accidents, page 138*)

Data on Plastics for Aircraft Use Detailed in New ANC–17 Booklet

Plastics, as a present substitute for critical war materials and as a coming material for use in the construction of post-war aircraft, is a subject about which everyone in general, and the aircraft industry in particular, would like more information.

In view of the increasing use of plastic materials in aircraft and the many requests for technical information on plastics for use by airplane designers, the Army, Navy and Civil Aeronautics Administration have prepared "Plastics for Aircraft" (ANC–17) [1] which soon will be distributed to the aircraft industry.

Uses Illustrated

"Plastics for Aircraft" will contain general information on mechanical and physical properties, molding and fabrication techniques and typical applications of important plastic materials primarily used in aircraft structures and parts. The names, various classifications of plastics materials and their predominant characteristics will be given. The chapter on physical characteristics will include strength, fatigue characteristics, effect of temperature and humidity, permanence, water absorption, resistance to chemicals, weathering, abrasion resistance, and electrical properties. Typical applications of plastics will be illustrated with photographs of airplane parts made of plastics, and a brief description of the part, that is, material, manufacturing process, weight, cost, material replaced and performance data will accompany each photograph. The book will also include a list of government specifications pertinent to plastic materials for aircraft use.

Some of the many present uses of plastics in aircraft construction are: windshields and cabin enclosures, fuel tanks, wing tips, pilots' seats, flooring, engine cowling, doors, engine inter-cylinder baffles, bearings, bushings, pulleys, conduits for wiring, handles and knobs, propeller spinners, instrument panels, radio parts, and trim tabs. The accompanying illustration shows typical applications of plastic parts on airplanes and their locations.

Composition Discussed

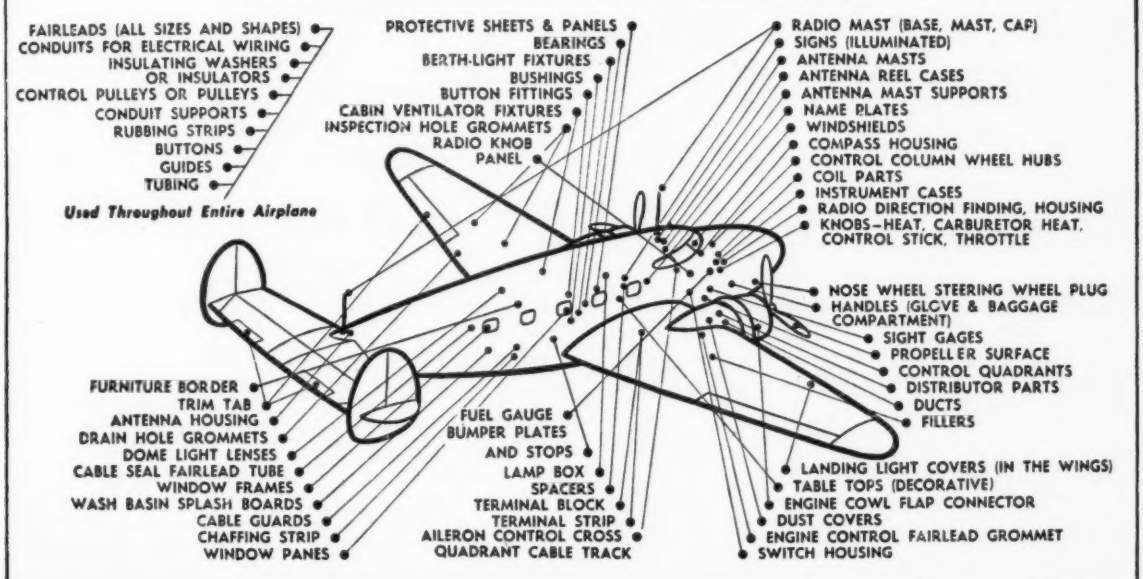
Plastic materials are generally divided into two groups: thermoplastic and thermosetting. In the thermoplastic group are those plastics which may be softened over and over by heat, but become solid again upon cooling. The cellulose derivatives, some synthetic resins such as acrylics, polystyrene and vinyl materials, and most of the natural resins are examples of this type. The thermosetting plastics are those which through chemical change become insoluble and infusible when hardened by heat and pressure or by heat alone. Most of the molded products of synthetic resin composition such as phenolic, urea-formaldehyde, and melamine-formaldehyde resins belong to the thermosetting group.

Resins are made into useful products by three general methods of fabrication; namely, molding, casting, and laminating. For use in molding compositions the resins are usually combined with fillers which not only reduce the cost but also impart desirable qualities to the finished product. The most commonly used fillers are wood flour, cotton, asbestos, rag, mica, paper, and graphite. Compression molding is carried out in hydraulic presses under pressures of one or more tons per square inch and temperatures from about 300° to 350° F. Because of the long chilling period required for thermoplastics when molded by compression methods, injection molding is used for these materials. In this process the plastic is forced from the heating chamber into a relatively cool mold and hardens in a few seconds. Resins for use in a casting process are poured in a liquid state into molds and hardened by slow baking. The third method of fabricating resins is by using them as binders for cloth, paper or wood. These laminated materials are made by impregnating the sheets with a solution of the resins, drying, and bonding many layers together by the application of heat and pressure.

As new plastic materials and processes develop, "Plastics for Aircraft" will be revised from time to time so that airplane designers will be provided with an up-to-date, reliable source of information on this important engineering material.—*Katherine Stinson, CAA Associate Aeronautical Engineer.*

[1] ANC–17, Plastics for Aircraft, will be placed on sale by the Superintendent of Documents, Government Printing Office, Washington, D. C., in the near future. The exact date and price will be announced in the Journal.

PLASTIC PARTS ON AIRPLANES



CHART– COURTESY OF E. I. DU PONT DE NEMOURS & CO. (INC.)

Five Airlines Ask Routes to Europe, Caribbean, Latin America, Hawaii

In a landslide of over 80 applications, the Board's September mail brought requests from five operating airlines for routes to Europe, the Caribbean, and the southern Americas.

To Great Britain

PCA has asked for service between any of the cities on the eastern seaboard of the United States that the CAB may designate as ports of origin or entry to any ports of entry for air commerce in Great Britain that may be designated. The applicant proposes to use anchored seadromes in operating the route.

Pacific and Atlantic

TWA has applied for service from Los Angeles or San Diego to Honolulu, on the Pacific side, and from Washington, New York, and Boston to London and Paris on the Atlantic side. Inland Chicago is the starting point of another route requested to the same European terminals.

Europe, Latin America

Braniff has applied for routes in nine European countries, eight southern American countries, and a chain route through the West Indies. From Fort Worth or Dallas, Braniff would take off for Madrid, Spain, using Bermuda and the Azores as stepping stones, and from Madrid to Rome, London, and Stockholm.

To the south Braniff has prepared a route from Houston, through Mexico, the Canal Zone, Colombia, Ecuador, Peru, and Bolivia, to Asuncion, Paraguay; and from there to Rio De Janeiro, Brazil, and Buenos Aires, Argentina.

The proposed route through the West Indies, starting at Houston, would touch a chain of points from Cuba, Jamaica, Haiti, Dominican Republic, Puerto Rico, Antigua, Guadelupe, Martinique, St. Lucia, Barbados, Granada, and Trinidad to coastal cities in Venezuela and Colombia.

Caribbean, South America

Eastern Airlines applied for 13 routes in the Caribbean area, and Central and South America. From the various starting places of Boston, Chicago, Detroit, St. Louis, and Kansas City, Eastern has as one of its main objectives Nassau, B. W. I. and Ciudad Trujillo, D. R. Beyond Ciudad Trujillo route plans include Caracas, Venezuela, and Manaos, Brazil. Out of Manaos, Eastern would go south to Buenos Aires and east to Rio de Janeiro. Among other routes in the application is one from New Orleans to Mexico City and another from New Orleans to Balboa, Canal Zone and on down through South America.

New Orleans to Mexico City

Chicago and Southern Air Lines requested air service between New Orleans to Mexico City by the way of Tampico.

Aerial Taxi and Bus

Among the new applicants, the Yellow Cab Company of Cleveland, Inc., proposed to operate an aerial taxicab service in Cleveland, Ohio, and metropolitan area. Southeastern Greyhound Lines asked for 20 helicopter routes which would parallel its bus routes and indicated that it planned to coordinate the air service with that of the Greyhound Corp.

Pennsylvania-Central Airlines, planning expansion and reorganization of its present domestic service, applied for 23 new routes, 19 extensions to present routes and nonstop service between several cities.

TWA filed 23 applications asking for new routes and amendments and extensions to present routes.

Board Defers Major Decision In "Seaboard Case"

An opinion and order in the "Eastern Seaboard" case, involving proposed transportation along the eastern seaboard south of New York to Nassau were recently released by the Civil Aeronautics Board.

The order amended Eastern Airlines' certificate for route 5 to authorize direct service between Raleigh and Charlotte, N. C., Atlanta, Ga., and other cities on that route. In addition, Columbia, S. C., was added to route 6, thus providing direct north-south service from that city to important metropolitan areas in the north and to Savannah, Ga., Jacksonville and Miami, Fla., to the south. The applications of Eastern and Pennsylvania-Central Airlines Corporation involving proposed transportation in the Piedmont area were consolidated for decision with other pending applications involving service in the same general area.

The opinion stated that the long-range approach to the future development of air transportation in the middle American regions necessitates deferring consideration of all applications included in the Atlantic Seaboard case except with respect to certain local services.

AIR CARRIER OPERATIONS STATISTICS

Domestic Operations by Routes for January–June 1943—Table A

Operator	Routes operated	Months operated	Revenue miles flown	Revenue passengers carried	Revenue passenger miles flown	Express carried (pounds)	Express pound-miles flown	Revenue passenger load factor (percent)
All American Aviation, Inc.	Pittsburgh to Huntington, Philadelphia, Williamsport, Jamestown, etc.	6	498,076	0	0	55,814	7,014,008	0
American Airlines, Inc.	Dallas to Los Angeles	6	3,671,351	78,919	64,289,036	1,058,705	1,073,972,739	
	New York to Chicago	6	2,263,709	95,028	34,293,625	3,682,924	1,590,337,777	
	Boston to New York	6	587,781	58,951	10,008,480	1,266,858	199,173,313	
	Boston to Cleveland	6	102,257	8,967	1,302,309	168,134	30,042,982	
	Cleveland to Nashville	6	354,124	27,104	5,896,581	489,642	127,947,464	
	New York to Fort Worth	6	3,344,147	96,372	56,370,211	1,497,213	858,066,798	
	Washington to Chicago	6	918,227	33,133	14,121,964	620,969	248,778,081	
	Chicago to Fort Worth	6	661,061	23,779	11,297,934	455,965	289,579,653	
	Buffalo to Toronto	6	20,377	2,339	178,540	16,016	1,217,216	
	El Paso to Mexico City	6	770,232	9,552	9,196,530	54,264	51,421,292	
	Total		12,693,266	434,144	206,955,210	9,310,690	4,470,537,315	71.54
Braniff Airways, Inc.	Chicago to Dallas	6	1,061,229	30,404	17,058,966	428,075	254,691,757	
	Dallas to Brownsville	6	761,155	5,321	11,573,028	198,367	52,166,532	
	San Antonio to Corpus Christi	2	12,213	639	120,553	2,593	491,815	
	Total		1,834,597	76,364	28,752,547	629,035	307,350,104	90.08

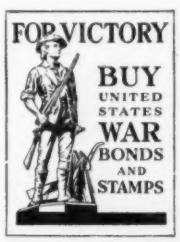
Domestic Operations by Routes January–June 1943—Table A—Continued

Operator	Routes operated	Months operated	Revenue miles flown	Revenue passengers carried	Revenue passenger miles flown	Express carried (pounds)	Express pound-miles flown	Revenue passenger load factor (percent)
Chicago & Southern Air Lines, Inc.	Chicago to New Orleans	6	889,289	34,775	14,104,392	340,828	153,727,001	
	Memphis to Houston	6	175,785	6,924	2,286,857	45,243	19,046,584	
	Total		1,065,074	41,699	16,391,249	386,071	172,773,585	80.25
Continental Air Lines, Inc.	Denver to El Paso	6	523,427	16,780	5,229,992	38,637	14,131,703	
	Pueblo to Tulsa	6	214,889	7,605	1,801,245	13,676	2,573,893	
	Total		738,316	24,385	7,031,237	52,313	16,705,596	84.58
Delta Air Corporation	Charleston & Savannah to Fort Worth.	6	738,709	35,630	13,807,816	166,227	70,505,579	
	Atlanta to Cincinnati	6	263,353	14,674	4,785,994	111,413	35,860,449	
	Total		1,002,062	50,304	18,593,810	277,640	106,366,028	88.48
Eastern Air Lines, Inc.	New York to Brownsville	6	2,391,182	72,344	41,282,598	732,855	388,731,060	
	New York to Miami	6	2,955,921	74,804	42,665,739	939,648	754,121,880	
	Chicago to Jacksonville	6	988,816	40,590	16,973,257	437,378	201,463,148	
	Atlanta to Tampa	6	141,900	7,028	2,505,150	53,212	20,610,390	
	Total		6,477,819	194,766	103,426,744	2,163,093	1,364,926,478	85.51
Inland Air Lines, Inc.	Denver to Great Falls	6	249,772	5,037	1,748,699	12,792	2,886,000	
	Cheyenne to Huron	6	138,135	0	0	1,066	363,950	
	Total		387,907	5,037	1,748,699	13,858	3,249,950	62.09
Mid-Continent Airlines, Inc.	Minneapolis to Tulsa	6	373,746	11,066	3,070,693	53,287	11,812,947	
	Minneapolis to St. Louis, Des Moines, and Kansas City.[1]	6	194,690	1,256	345,151	7,779	2,293,532	
	Total		568,436	12,322	3,415,844	61,066	14,106,479	62.12
National Airlines, Inc.	Jacksonville to Miami	6	294,317	14,566	3,462,136	57,889	12,232,034	
	Jacksonville to New Orleans	6	504,423	17,090	6,147,636	102,394	26,425,398	
	Total		798,740	31,656	9,609,772	160,283	38,687,432	86.36
Northeast Airlines, Inc.	Boston to Moncton & Presque Isle	6	297,146	13,465	3,328,494	34,511	7,488,043	53.41
Northwest Airlines, Inc.	Chicago to Seattle	6	1,809,534	47,326	23,475,878	717,034	491,497,710	
	Minneapolis to Duluth	6	34,875	0	0	3,405	486,915	
	Total		1,844,409	47,326	23,475,878	720,439	491,984,625	79.37
Pennsylvania-Central Airlines Corp.	Norfolk to Detroit	6	944,273	79,619	16,674,282	1,628,276	303,464,728	
	Detroit to Milwaukee	6	82,968	6,712	1,125,378	69,551	12,380,378	
	Pittsburgh to Buffalo	6	70,860	4,713	928,252	74,920	11,072,560	
	Pittsburgh to Birmingham	6	221,867	8,717	2,917,827	30,586	9,549,079	
	Total		1,319,968	99,761	21,645,739	1,803,333	336,466,745	79.18
Transcontinental & Western Air, Inc.	New York to Los Angeles	6	5,457,308	124,039	77,146,604	3,264,389	2,216,472,597	
	Dayton to Chicago	6	83,244	6,000	1,322,734	234,522	48,724,279	
	Boulder City to San Francisco	6	166,523	4,205	1,649,251	16,365	8,236,248	
	Kansas City to Chicago and Pittsburgh.	6	1,604,628	40,917	21,881,187	1,111,058	587,055,436	
	St. Louis to Detroit via Cincinnati & Dayton.	6	292,718	19,508	4,628,476	274,806	65,653,103	
	Total		7,604,420	194,669	106,628,252	4,901,140	2,926,141,663	86.92
United Air Lines Transport Corp	New York to San Francisco	6	7,325,881	122,162	105,032,477	3,820,619	3,226,634,108	
	Salt Lake to Seattle	6	588,972	18,779	10,609,300	143,784	98,526,393	
	Los Angeles to Seattle	6	2,228,781	102,532	41,773,057	760,562	332,612,770	
	Seattle to Vancouver	6	49,611	4,897	656,933	19,475	2,403,881	
	Total		10,193,245	248,370	158,071,767	4,744,440	3,660,177,152	89.27
Western Air Lines, Inc.	San Diego to Salt Lake City	6	707,506	29,366	12,000,820	453,466	201,001,877	
	Salt Lake City to Great Falls	6	167,591	4,282	1,614,610	15,317	4,680,759	
	Great Falls to Lethbridge	6	34,434	1,208	162,815	6,535	789,393	
	Total		909,531	34,856	13,778,245	475,318	206,472,029	83.41
	Grand Total		**48,233,012**	**1,509,124**	**722,853,487**	**25,789,044**	**14,130,447,232**	**85.72**

[1] Extended to Des Moines and Kansas City in May.

Total Domestic Operations—Table B

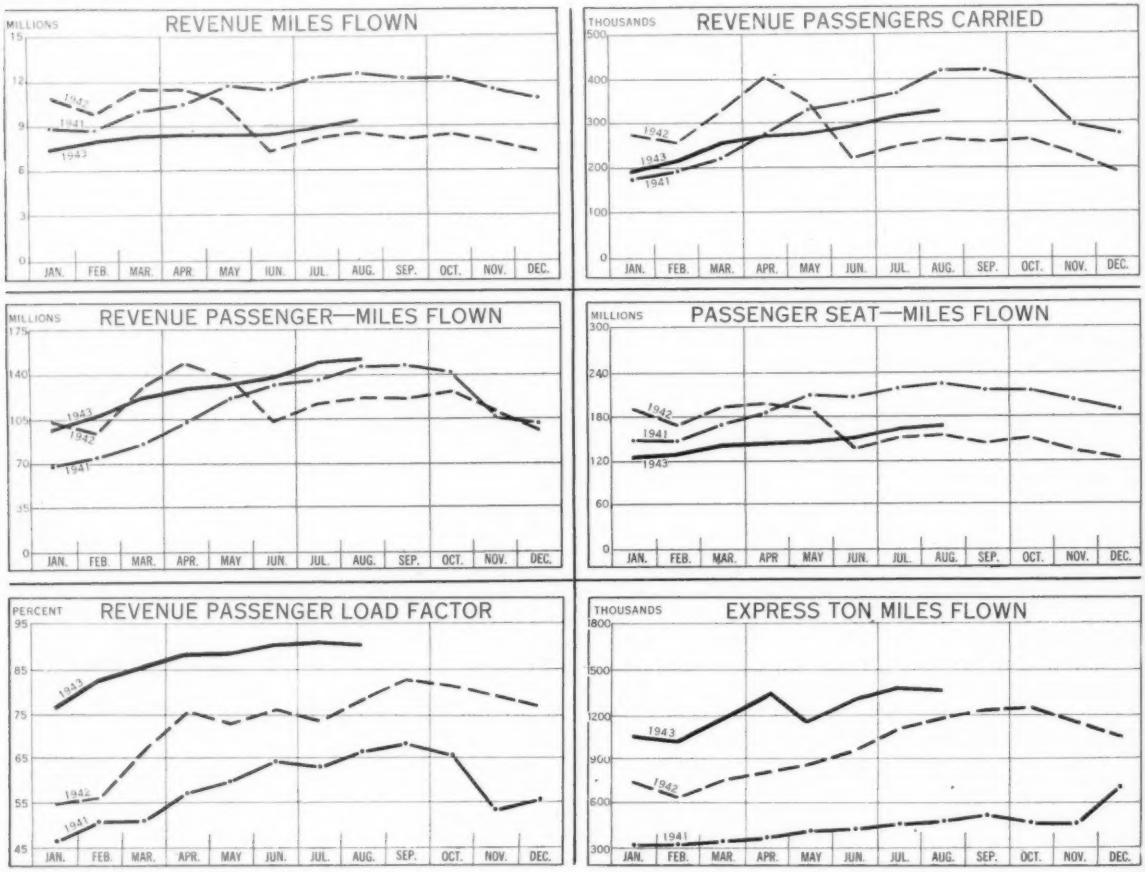
Item of comparison	January–June 1943	January–June 1942	Percent of increase or decrease over 1942
Revenue miles flown	48,233,012	61,997,873	−22.21
Revenue passengers carried	1,509,124	1,875,268	−19.52
Revenue passenger miles flown	722,853,487	718,646,082	.59
Express carried (pounds)	25,789,044	16,317,713	58.04
Express pound-miles flown	14,130,447,232	9,498,986,026	49.06
Available passenger seat-miles flown	843,232,076	1,076,369,832	−21.66
Revenue passenger load factor (percent)	85.72	66.77	28.38



Domestic Operations by Months January–June 1943—Table C

Item of comparison	January	February	March	April	May	June	Total
Number of operating carriers	16	16	16	16	16	16	
Revenue miles flown	7,508,260	7,585,465	8,126,495	8,288,177	8,314,154	8,410,461	48,233,012
Revenue passengers carried	198,888	223,297	252,464	271,212	273,318	289,945	1,509,124
Revenue passenger miles flown	97,507,731	107,276,243	120,660,312	129,446,913	130,130,118	137,832,170	722,853,487
Express carried (pounds)	3,621,635	3,647,269	4,320,107	4,816,449	4,549,436	4,834,148	25,789,044
Express pound-miles flown	2,111,189,608	2,039,554,970	2,345,398,933	2,676,656,393	2,378,253,426	2,579,393,902	14,130,447,232
Available passenger seat-miles flown	126,757,082	129,595,326	141,293,811	146,176,701	147,336,058	152,073,098	843,232,076
Revenue passenger load factor (percent)	76.92	82.78	85.40	88.56	88.32	90.64	85.72

Comparative Charts of Domestic Operations for 1941, 1942, and the First 8 Months of 1943



Accidents

(*Continued from page 132*)

were also on the downwind leg of the traffic pattern. The Luscombe, having a higher cruising speed, overtook the Piper, which had just reached the prescribed traffic pattern altitude of 800 feet, and had been leveled off and throttled back to cruising speed. When Palmer and his student in the Piper observed the Luscombe it was from 50 to 75 feet to their left and slightly to the rear, converging with their flight path at an angle of from approximately 45 to 60 degrees. Palmer took over the controls at the moment of the collision. The entering edge of the Luscombe's right wing struck the Piper's left rear diagonal brace strut just below the wing fitting. The Luscombe, its right wing badly mangled by the impact, immediately fell off, made about 1½ turns of a left spin and then dived vertically to the railroad tracks below. The impact raised the Piper's left wing to an angle of approximately 40°, throwing the aircraft into a right spiraling turn from which the instructor was unable to recover. It struck the ground on the right wing and right side of the fuselage. There was no evidence of failure of any part of either aircraft prior to the collision.

Probable cause.—Failure of Lauer, pilot of the overtaking aircraft, to give sufficient attention to other traffic.

Audit Chief in Peru

A. H. Gilbert, who authored the first uniform system of accounting for air carriers, now Chief of the Audits Section in the Civil Aeronautics Board's Economic Bureau, has left for Lima, Peru, where he will examine the books of Pan American-Grace Airways, Inc. He will be gone several weeks.

Correction

Pilot of the American Airlines DC-3 which crashed in Kentucky, July 28, was H. A. Stiller and not Capt. B. A. Carpenter as reported in the August 15 Journal.

Domestic Air Carrier Operation Statistics for the Month of July 1943

Operator	Routes operated	Revenue miles flown	Revenue passengers carried [1]	Revenue passenger miles flown	Express carried (pounds)	Express pound-miles flown	Passenger seat-miles flown	Revenue passenger load factor (percent)
All American Aviation, Inc.	Pittsburgh-Jamestown, Huntington, Williamsport, Philadelphia, via Harrisburg.	94,428	0	0	19,001	2,761,162	0	0
American Airlines, Inc.	Dallas Los Angeles	628,624	15,097	11,959,927	186,464	191,685,541	12,521,602	95.51
	New York-Chicago	437,123	20,850	7,336,708	837,146	345,137,961	8,110,104	90.46
	Boston-New York	108,426	11,596	1,959,565	258,885	42,207,356	2,163,681	90.57
	Boston-Cleveland	19,902	2,321	327,636	45,942	8,750,758	408,812	80.14
	Cleveland-Nashville	61,658	5,041	1,104,246	120,281	31,728,497	1,272,613	86.77
	New York-Fort Worth	620,471	19,316	11,113,647	283,411	150,806,561	12,019,990	92.46
	Washington-Chicago	171,052	6,958	2,848,122	138,372	59,177,662	3,158,000	90.19
	Chicago-Fort Worth	116,034	4,496	2,095,813	86,774	59,301,843	2,328,240	90.02
	Buffalo-Toronto	4,560	764	58,064	6,835	519,460	95,836	60.59
	El Paso or Fort Worth-Mexico City	131,583	2,169	2,002,669	10,439	10,559,694	2,424,521	82.60
	Total	2,299,433	88,608	40,806,397	1,974,549	899,875,333	44,503,399	91.69
Braniff Airways, Inc.	Chicago-Dallas	220,332	6,758	3,881,794	98,561	61,679,428	3,988,587	97.32
	Amarillo-Brownsville	139,835	9,150	2,348,202	48,919	12,311,611	2,550,651	92.06
	Total	360,167	15,908	6,229,996	147,480	73,991,039	6,539,238	95.27
Chicago & Southern Air Lines, Inc.	Chicago-New Orleans	154,869	6,458	2,654,602	72,609	32,904,075	2,969,179	89.41
	Memphis-Houston	28,318	1,379	431,012	8,140	3,693,400	522,884	82.43
	Total	183,187	7,837	3,085,614	80,749	36,597,475	3,492,063	88.36
Continental Air Lines, Inc.	Denver-El Paso	99,471	3,444	1,052,799	13,362	6,875,292	1,150,477	91.51
	Wichita-Tulsa, Pueblo	40,526	1,918	452,030	3,195	1,006,714	481,414	93.90
	Total	139,997	5,362	1,504,829	16,557	7,882,006	1,631,891	92.21
Delta Air Corporation	Charleston and Savannah-Fort Worth	129,902	6,625	2,510,298	27,109	11,330,792	2,711,107	92.59
	Atlanta-Cincinnati	47,390	2,881	940,631	21,551	6,751,774	999,599	94.10
	Total	177,292	9,506	3,450,929	48,660	18,082,566	3,710,706	93.00
Eastern Air Lines, Inc.	New York-Brownsville	419,298	13,142	7,450,857	114,912	56,930,691	8,435,395	88.33
	New York-Miami	521,544	13,484	7,271,500	147,337	110,443,142	8,848,007	82.18
	Chicago-Jacksonville	173,605	7,819	3,235,087	68,580	29,504,810	3,434,604	94.19
	Atlanta-Tampa	24,882	1,136	411,343	8,344	3,018,446	520,806	78.98
	Total	1,139,329	35,581	18,368,787	339,173	199,897,089	21,238,812	86.49
Inland Air Lines, Inc.	Denver-Great Falls	50,024	1,231	391,707	2,006	548,548	572,744	68.39
	Cheyenne-Huron	35,004	0	0	152	41,349	0	0
	Total	85,028	1,231	391,707	2,158	589,897	572,744	68.39
Mid-Continent Airlines, Inc.	Minneapolis-Tulsa	64,434	2,268	599,203	13,103	2,902,942	842,444	71.12
	Minneapolis-Des Moines, St. Louis, Kansas City	41,095	745	203,970	1,440	386,485	391,478	52.10
	Total	105,529	3,013	803,173	14,543	3,289,427	1,233,922	65.09
National Airlines, Inc.	Jacksonville-Miami	50,902	2,550	595,208	8,327	1,808,250	710,406	83.78
	Jacksonville-New Orleans	93,938	3,235	1,144,940	18,563	6,693,831	1,299,175	88.13
	Total	144,840	5,785	1,740,148	26,890	8,502,081	2,009,581	86.59
Northeast Airlines, Inc.	Boston-Presque Isle and Moncton	66,144	4,191	1,038,509	10,642	2,228,886	1,389,024	74.77
Northwest Airlines, Inc.	Chicago-Seattle	335,433	10,959	5,486,714	103,575	61,873,275	6,071,595	90.37
	Minneapolis-Duluth	8,580	0	0	549	78,507	0	0
	Total	344,013	10,959	5,486,714	104,124	61,951,782	6,071,595	90.37
Pennsylvania-Central Airlines Corp.	Norfolk-Detroit	228,313	20,470	4,119,523	426,329	73,958,357	4,735,715	86.99
	Detroit-Milwaukee	16,120	1,852	299,694	29,560	5,948,269	338,520	88.53
	Pittsburgh-Buffalo	13,516	1,212	233,126	7,147	1,082,348	283,836	82.13
	Pittsburgh-Birmingham	39,804	1,867	624,506	5,471	1,816,819	833,140	74.96
	Total	297,753	25,401	5,276,849	468,507	82,805,793	6,191,211	85.23
Transcontinental & Western Air, Inc.	New York-Los Angeles	989,782	25,735	15,790,482	599,030	394,165,720	17,206,592	91.77
	Dayton-Chicago	15,686	1,339	267,597	59,024	12,358,147	297,464	89.96
	Boulder City-San Francisco	31,762	954	382,299	15,244	7,755,376	576,059	66.36
	Kansas City-Pittsburgh via Chicago	290,351	8,659	4,678,907	195,571	104,968,982	4,813,653	97.20
	St. Louis-Detroit via Cincinnati and Dayton	63,808	4,628	1,048,684	61,892	12,291,542	1,235,682	84.87
	Total	1,391,389	41,315	22,167,969	930,761	531,539,767	24,129,450	91.87
United Air Lines Transport Corp.	New York-San Francisco	1,361,370	24,691	23,683,110	845,499	713,679,203	24,843,970	95.33
	Salt Lake-Seattle	99,328	3,456	1,932,704	33,731	23,592,262	2,108,714	91.65
	Seattle-San Diego	401,932	19,648	7,929,027	119,221	49,985,481	8,238,837	96.24
	Seattle-Vancouver	16,050	2,113	275,094	4,898	594,718	327,379	84.03
	Total	1,878,680	49,908	33,819,935	1,003,349	787,851,664	35,518,900	95.22
Western Air Lines, Inc.	San Diego-Salt Lake City	133,717	6,086	2,552,421	71,620	37,365,255	2,789,737	91.49
	Salt Lake City-Great Falls	30,844	1,054	352,849	1,881	677,033	426,833	82.67
	Great Falls-Lethbridge	9,094	332	48,516	432	64,380	110,014	44.10
	Total	173,655	7,472	2,953,786	73,933	38,106,668	3,326,584	88.79
	Grand Total	**8,880,864**	**312,077**	**147,125,342**	**5,260,576**	**2,755,952,635**	**161,559,120**	**91.07**

[1] Where a company operates more than one route, the passengers carried may be duplicated between routes.

Passengers carried (total revenue and nonrevenue) 320,096. Passenger miles flown (total revenue and nonrevenue) 150,013,387.

Domestic Air Carrier Operation Statistics for the First Seven Months of 1943 as Compared With the Same Period of 1942

Operator	Revenue miles flown January–July		Revenue passengers carried January–July		Revenue passenger miles flown January–July		Express carried (pounds) January–July	
	1943	1942	1943	1942	1943	1942	1943	1942
All American Aviation, Inc	592,504	476,406	0	0	0	0	74,815	53,800
American Airlines, Inc	14,992,699	17,327,331	522,752	643,861	247,761,607	241,676,372	11,285,239	5,581,292
Braniff Airways, Inc	2,194,764	2,855,267	92,272	92,035	34,982,543	29,679,274	776,515	507,498
Catalina Air Transport	0	41,924	0	8,684	0	260,520	0	64,083
Chicago & Southern Air Lines, Inc	1,248,261	1,376,146	49,536	44,030	19,476,863	16,541,115	466,820	274,539
Continental Air Lines, Inc	878,313	1,099,913	29,747	20,056	8,536,066	5,251,763	68,870	41,983
Delta Air Corporation	1,179,354	1,553,116	59,810	64,810	22,044,739	18,930,175	326,300	153,929
Eastern Air Lines, Inc	7,617,148	10,844,956	230,347	326,861	121,795,531	139,229,495	2,502,266	2,183,744
Inland Air Lines, Inc	472,935	678,701	6,268	7,741	2,140,406	1,991,331	16,016	19,631
Mid-Continent Airlines, Inc	673,965	1,071,849	15,335	19,259	4,219,017	5,150,283	75,609	49,209
National Airlines, Inc	943,580	902,527	37,441	30,318	11,349,920	8,224,926	187,173	121,450
Northeast Airlines, Inc	363,290	518,815	17,656	16,822	4,367,003	3,197,962	45,153	49,747
Northwest Airlines, Inc	2,188,422	3,097,059	58,285	73,586	28,962,592	32,471,602	824,563	596,984
Pennsylvania-Central Airlines Corporation	1,617,721	3,018,128	125,162	182,892	26,922,588	37,524,520	2,271,840	1,290,820
Transcontinental & Western Air, Inc	8,995,809	10,177,891	235,984	239,458	128,796,221	113,305,073	5,831,901	3,337,002
United Air Lines Transport Corporation	12,071,925	13,593,066	298,278	311,097	191,891,702	162,245,886	5,747,789	4,812,468
Western Air Lines, Inc	1,083,186	1,533,916	42,328	44,859	16,732,031	13,829,609	549,251	713,518
Total	57,113,876	70,077,011	1,821,201	2,126,369	869,978,829	829,509,906	31,050,120	19,851,693
Index (1942=100)	81.50	100.00	85.65	100.00	104.88	100.00	156.41	100.00

Operator	Express pound-miles flown January–July		Passenger seat-miles flown January–July		Revenue passenger load factor (percent) January–July	
	1943	1942	1943	1942	1943	1942
All American Aviation, Inc	9,775,170	5,449,067	0	0	0	0
American Airlines, Inc	5,370,412,648	2,794,840,565	286,258,148	334,470,922	86.55	72.26
Braniff Airways, Inc	381,341,143	214,429,157	38,457,870	48,554,220	90.96	61.13
Catalina Air Transport	0	2,011,530	0	379,320	0	68.68
Chicago & Southern Air Lines, Inc	209,371,060	109,933,544	23,916,377	28,793,287	81.44	57.45
Continental Air Lines, Inc	24,587,602	12,611,437	9,945,008	10,324,865	85.83	50.87
Delta Air Corporation	124,448,594	56,581,906	24,725,620	27,645,839	89.16	68.47
Eastern Air Lines, Inc	1,564,823,567	1,343,482,519	142,185,854	209,747,246	85.84	66.38
Inland Air Lines, Inc	3,839,847	3,795,244	3,389,125	6,658,958	63.16	29.90
Mid-Continent Airlines, Inc	17,395,906	12,736,176	6,733,081	12,271,926	62.66	41.97
National Airlines, Inc	47,189,513	30,200,773	13,137,758	12,066,634	86.39	68.16
Northeast Airlines, Inc	9,716,929	12,472,972	7,621,337	10,105,089	57.30	31.65
Northwest Airlines, Inc	553,936,407	437,443,117	35,648,132	52,885,014	81.25	61.40
Pennsylvania-Central Airlines Corporation	419,272,538	259,316,263	33,530,084	60,687,672	80.29	61.83
Transcontinental & Western Air, Inc	3,457,681,430	2,114,010,877	146,807,867	177,383,150	87.73	63.88
United Air Lines Transport Corporation	4,448,028,816	3,964,593,537	212,590,016	209,487,048	90.26	77.45
Western Air Lines, Inc	244,578,697	320,750,439	19,844,919	25,145,373	84.31	55.00
Total	16,886,399,867	11,694,659,123	1,004,791,196	1,226,606,563	86.58	67.63
Index (1942=100)	144.39	100.00	81.92	100.00	128.02	100.00

	January	February	March	April	May	June	July	Total
Passengers carried (total revenue and non-revenue)	208,380	233,049	265,175	280,913	282,103	297,760	320,096	1,887,476
Passenger miles flown (total revenue and non-revenue)	101,410,602	110,982,551	124,256,467	132,984,531	133,266,615	140,745,710	150,013,387	893,659,863

Routes Not Requested May Be Granted

Applicants for service between the United States and points in Mexico, Central and South America, and the Caribbean may get more routes than they ask for under a policy recently announced by the Civil Aeronautics Board. The Board proposes to proceed at an early date with the consideration of applications for certificates of public convenience and necessity for new air transportation in that area.

"It is desirable," the Board said in announcing the new policy, "that the consideration of the need for new routes be subject to a minimum of restrictions and that the proceedings, therefore, should not be limited to the consideration of the routes set forth in detail in applications. It is suggested that all applications include a general provision which will permit the application to be construed as an application for any new route which the Board may find to be required by the public convenience and necessity within the general area the applicant desires to serve. Such a provision should be included by appropriate amendment in those applications which already have been filed."

Makes Profit

All American Aviation, which operates an air pick-up service, earned a net profit of $27,689.68 this year as compared to a net loss of $22,407.40 the previous year. The airline made 58,640 pick-ups and deliveries, carried 394,360 pounds of mail, and 122,185 pounds of air express.

Board Reports Findings In Pan Am Clipper Crash

"Inadvertent contact of the left wing tip of the aircraft with water while making a descending turn preparatory to landing," is the reason the Board found for the Pan American clipper crash, fatal to 24, in the Tagus river at Lisbon, Portugal, February 22.

Contrary to the testimony of Capt. R. O. D. Sullivan that he found the elevators inoperative at an altitude of about 400 feet, thorough examination of the recovered parts of the elevator control system indicated no fault in the system which would account for failure of the airplane to respond to the controls. The first officer (copilot), who was at the controls with Captain Sullivan, was one of the five crew members fatally injured.

AIRLINE ACCIDENT STATISTICS 1938–JUNE 1943

Vital statistics and results of accidents, 1938 through 1942 [1]

Items of consideration	DOMESTIC						INTERNATIONAL AND TERRITORIAL						TOTAL (Domestic, international and territorial)					
	1938	1939	1940	1941	1942	Five year average	1938	1939	1940	1941	1942	Five year average	1938	1939	1940	1941	1942	Five year average
Number of accidents involving:																		
Fatal injuries	5	2	3	4	5	3.80	3	1	0	1	0	1.00	8	3	3	5	5	4.80
Severe injuries	1	1	1	3	1	1.40	0	0	1	0	0	.20	1	1	2	3	1	1.60
Minor and no injuries	27	30	38	26	25	29.20	8	5	10	6	3	6.40	35	35	48	32	28	35.60
Total accidents	33	33	42	33	31	34.40	11	6	11	7	3	7.60	44	39	53	40	34	42.00
I. Injury to personnel:																		
Pilots:																		
Fatal injury	3	1	3	3	5	3.00	3	1	0	0	0	.80	6	2	3	3	5	3.80
Severe injury	0	1	1	1	0	.60	0	0	1	1	0	.40	0	1	2	2	0	1.00
Minor injury	4	0	1	5	2	2.40	1	0	0	0	0	.20	5	0	1	5	2	2.60
Uninjured	26	33	38	25	24	29.20	7	5	10	6	3	6.20	33	38	48	31	27	35.40
Copilots:																		
Fatal injury	4	1	3	3	5	3.20	3	1	0	0	0	.80	7	2	3	3	5	4.00
Severe injury	0	1	0	2	1	.80	0	0	1	0	0	.20	0	1	1	2	1	1.00
Minor injury	2	0	2	2	0	1.20	1	0	0	1	0	.40	3	0	2	3	0	1.60
Uninjured	27	31	37	25	25	29.00	5	5	10	6	3	5.80	32	36	47	31	28	34.80
Passengers:																		
Fatal injury	25	9	35	35	55	31.80	7	10	0	2	0	3.80	32	19	35	37	55	35.60
Severe injury	4	3	6	22	2	7.40	0	1	0	0	0	.20	4	4	6	22	2	7.60
Minor injury	6	4	6	26	4	9.20	8	1	1	8	0	3.60	14	5	7	34	4	12.80
Uninjured	203	228	356	258	314	271.80	35	46	89	117	23	62.00	238	274	445	375	337	333.80
Aircraft crew:																		
Fatal injury	3	1	4	3	6	3.40	13	2	0	0	0	3.00	16	3	4	3	6	6.40
Severe injury	0	0	0	2	1	.60	0	0	1	0	0	.20	0	0	1	2	1	.80
Minor injury	1	1	1	2	0	1.00	0	1	2	4	1	1.60	1	2	3	6	1	2.60
Uninjured	17	15	38	26	22	23.60	10	24	28	19	6	17.40	27	39	66	45	28	41.00
Ground personnel:																		
Minor injury	0	2	0	0	0	.40	0	0	0	0	0	0.00	0	2	0	0	0	.40
Third parties:																		
Minor injury	0	0	0	0	0	0.00	14	0	0	0	0	2.80	14	0	0	0	0	2.80
Total injuries and non-injuries:																		
Fatal injury	35	12	45	44	71	41.40	26	14	0	2	0	8.40	61	26	45	46	71	49.80
Severe injury	4	5	7	27	4	9.40	0	1	3	1	0	1.00	4	6	10	28	4	10.40
Minor injury	13	7	10	35	6	14.20	24	2	3	13	1	8.60	37	9	13	48	7	22.80
Uninjured	273	307	469	334	385	353.60	57	80	137	148	35	91.40	330	387	606	482	420	445.00
Total	325	331	531	440	466	418.60	107	97	143	164	36	109.40	432	428	674	604	502	528.00
II. Damage to Material:																		
Airplanes:																		
Completely demolished	6	2	3	6	5	4.40	5	1	1	1	0	1.60	11	3	4	7	5	6.00
Complete overhaul	7	8	10	6	4	7.00	0	2	0	1	0	.60	7	10	10	7	4	7.60
Major assembly repairs	11	20	16	15	12	14.80	6	3	5	3	1	3.60	17	23	21	18	13	18.40
Minor repairs	9	5	17	6	8	9.00	0	0	5	2	2	1.80	9	5	22	8	10	10.80
Not damaged	0	1	0	1	2	.80	0	0	0	0	1	.20	0	1	0	1	3	1.00
III. Nature of accident:																		
Collision (see definition)	0	0	0	0	1	.20	0	0	0	0	0	0.00	0	0	0	0	1	.20
Collision (see definition)	2	1	5	6	4	3.60	1	0	0	0	0	.20	3	1	5	6	4	3.80
Spins or stalls (engine failure)	0	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0	0.00
Spins or stalls (not engine failure)	0	0	0	2	0	.40	0	0	0	0	0	0.00	0	0	0	2	0	.40
Forced landings	3	2	2	1	0	1.60	1	1	1	0	0	.60	4	3	3	1	0	2.20
Landing accidents	9	14	25	17	14	15.80	3	3	5	5	1	3.40	12	17	30	22	15	19.20
Take-off accidents	4	1	1	3	0	1.80	1	1	3	2	0	1.40	5	2	4	5	0	3.20
Taxying accidents	7	9	7	1	7	6.20	1	0	2	0	1	.80	8	9	9	1	8	7.00
Fires in the air	2	2	0	0	0	.80	1	0	0	0	0	.20	3	2	0	0	0	1.00
Structural failures	4	1	0	0	3	1.60	1	0	0	0	0	.20	5	1	0	0	3	1.80
Miscellaneous	2	3	2	3	2	2.40	0	0	0	0	1	.20	2	3	2	3	3	2.60
Indeterminate and doubtful	0	0	0	0	0	0.00	2	1	0	0	0	.60	2	1	0	0	0	.60
Miscellaneous information:																		
Fires after accident	1	[2] 1	0	[2] 2	[2] 3	1.40	0	[2] 1	0	0	0	.20	[2] 1	[2] 2	0	[2] 2	[2] 3	1.60
Propeller accidents to persons	0	[3] 1	0	0	[4] 1	.20	0	0	[5] 1	0	0	.20	0	[3] 1	[5] 1	0	[4] 1	.40
Nonscheduled airline accidents:																		
Instructional	5	2	2	2	4	3.00	0	0	3	[6] 7	1	2.20	5	2	5	9	5	5.20
Experimental	2	1	2	3	0	1.60	0	0	0	1	0	.20	2	1	2	4	0	1.80
Charter	1	0	0	0	0	.20	0	[7] 1	0	0	1	.40	1	1	0	0	1	.60
Ferrying	0	2	3	0	0	1.00	0	1	0	0	1	.40	0	3	3	0	1	1.40
Other	0	1	1	0	0	.40	0	0	1	1	0	.40	0	1	2	1	0	.80
Total nonscheduled accidents	8	6	8	5	4	6.20	0	2	4	9	3	3.60	[8] 8	[9] 8	[10] 12	[11] 14	[12] 7	9.80

[1] These statistics were prepared on the basis of N. A. C. A. definitions of I, Injury to Personnel; II, Damage to Material; and III, Nature of Accident contained in Report No. 576 "Aircraft Accidents—Method of Analysis," 1941. The same definitions were applied when these data appeared in Volume 2, No. 12 of the Civil Aeronautics Journal.

[2] This figure covers the number of fires occurring after accident. Results are included in the above regular aircraft accident statistics under Groups I, II, and III.

[3] Third party, 1 minor injury. Not included in the above statistics under Groups I, II, and III as it was not a flight accident.

[4] Ground crew, 1 severe injury. Not included in the above statistics under Groups I, II, and III as it was not a flight accident.

[5] Ground crew, 1 fatal injury. Not included in the above statistics under Groups I, II, and III as it was not a flight accident.

[6] Two accidents resulted in severe injury to 1 pilot and 1 copilot trainee; minor injury to 1 pilot, 1 copilot trainee, and 3 aircraft crew.

[7] This accident resulted in fatal injury to 1 pilot and 5 passengers.

[8] Involves 8 pilots, 5 copilot trainees, 1 copilot, 6 passengers, and 1 aircraft crew uninjured.

[9] In addition to the fatalities under note 6, 7 pilots, 2 copilot trainees, 3 copilots, 24 passengers, and 8 aircraft crew were uninjured.

[10] Involves 2 copilot trainees, 1 passenger and 2 aircraft crew, minor injury; 12 pilots, 4 copilot trainees, 5 copilots, 13 passengers, and 14 aircraft crew uninjured.

[11] In addition to persons in note 5, 2 pilots, 1 copilot and 1 third party received minor injury; 10 pilots, 6 copilot trainees, 3 copilots, and 17 aircraft crew were uninjured.

[12] Involves 2 pilots and 4 copilots, minor injury; 5 pilots, 9 copilot trainees, 2 copilots, 27 passengers, and 13 aircraft crew were uninjured.

Miles Flown per Accident and Fatality in Domestic, International, and Territorial Scheduled Air-Carrier Services, 1938 Through June 1943

Item of comparison	1938	1939	1940	1941	1942	January–June 1943
DOMESTIC:						
Miles flown	69,668,827	82,571,523	108,800,436	133,022,679	110,102,860	48,233,012
Total number of accidents	33	33	42	33	31	14
Miles flown per accident	2,111,177	2,502,167	2,590,487	4,030,990	3,551,705	3,445,215
Total number of fatal accidents	5	2	3	4	5	0
Miles flown per fatal accident	13,933,765	41,285,762	36,266,812	33,255,670	22,020,572	
Total number of pilot fatalities	3	1	3	3	5	0
Miles flown per pilot fatality	23,222,942	82,571,523	36,266,812	44,340,893	22,020,572	
Passenger miles flown	557,719,268	749,787,086	1,147,444,948	1,491,734,671	1,481,976,329	722,853,487
Total number of passenger fatalities	25	9	35	35	55	0
Passenger miles flown per passenger fatality	22,308,771	83,309,677	32,784,141	42,620,991	26,945,024	
INTERNATIONAL AND TERRITORIAL:						
Miles flown	8,528,412	8,404,540	10,716,827	15,188,865	20,575,034	
Total number of accidents	11	6	11	7	3	5
Miles flown per accident	775,310	1,400,757	974,257	2,169,838	6,858,345	
Total number of fatal accidents	3	1	0	1	0	3
Miles flown per fatal accident	2,842,804	8,404,540		15,188,865		
Total number of pilot fatalities	3	1	0	0	0	2
Miles flown per pilot fatality	2,842,804	8,404,540				
Passenger miles flown	60,110,655	85,031,146	117,719,111	185,214,555	272,261,747	
Total number of passenger fatalities	7	10	0	2	0	39
Passenger miles flown per passenger fatality	8,587,236	8,503,115		92,607,278		
TOTAL COMBINED SERVICES:						
Miles flown	78,197,239	90,976,063	119,517,263	148,211,544	130,677,894	
Total number of accidents	44	39	53	40	34	19
Miles flown per accident	1,777,210	2,332,720	2,255,042	3,705,289	3,843,467	
Total number of fatal accidents	8	3	3	5	5	3
Miles flown per fatal accident	9,774,655	30,325,354	39,839,088	29,642,309	26,135,579	
Total number of pilot fatalities	6	2	3	3	5	2
Miles flown per pilot fatality	13,032,873	45,488,032	39,839,088	49,403,848	26,135,579	
Passenger miles flown	617,829,923	834,818,242	1,265,164,059	1,676,949,226	1,754,238,076	
Total number of passenger fatalities	32	19	35	37	55	39
Passenger miles flown per passenger fatality	19,307,185	43,937,802	36,147,545	45,322,952	31,895,238	

Analysis of Causes of Accidents, 1938–1942

	Domestic						International and Territorial						Domestic, International and Territorial					
	1938	1939	1940	1941	1942	5-year average	1938	1939	1940	1941	1942	5-year average	1938	1939	1940	1941	1942	5-year average
Number of accidents involved	33	33	42	33	31	34.40	11	6	11	7	3	7.60	44	39	53	40	34	42.00
CAUSES (ALL FIGURES PERCENT OF TOTAL)																		
Personnel:																		
Pilots:																		
Error of judgment	6.52	3.03	7.86	17.27	5.48	8.05	0	0	5.45	11.43	9.98	4.47	4.89	2.56	7.36	16.25	5.88	7.40
Poor technique	7.57	11.37	17.98	19.70	13.23	14.19	6.84	16.64	12.72	42.86	0	16.18	7.39	12.18	16.89	23.75	12.06	14.55
Disobedience of orders or regulations	0	3.03	0	0	0	.58	0	0	0	0	0	0	0	2.56	0	0	0	.47
Carelessness or negligence	16.67	18.78	21.07	9.24	11.61	15.81	9.08	0	0	5.71	0	3.69	14.77	15.90	16.70	8.62	10.59	13.62
Miscellaneous	3.03	0	0	0	0	.58	0	0	0	0	0	0	2.27	0	0	0	0	.48
Total pilot errors	33.79	36.21	46.91	46.21	30.32	39.21	15.92	16.64	18.17	60.00	9.98	24.34	29.32	33.20	40.95	48.62	28.53	36.52
Other personnel	4.85	6.06	6.20	9.55	10.49	7.33	0	0	0	0	33.33	2.63	3.64	5.13	4.91	7.88	12.50	6.48
Total personnel errors	38.64	42.27	53.11	55.76	40.81	46.54	15.92	16.64	18.17	60.00	43.31	26.97	32.96	38.33	45.86	56.50	41.03	43.00
Material:																		
Power Plant:																		
Fuel system	0	0	1.43	.30	0	.41	9.08	0	18.17	0	0	4.90	2.27	0	4.90	.25	0	1.76
Cooling system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ignition system	0	0	0	0	0	0	0	0	0	14.29	0	2.63	0	0	0	2.50	0	.47
Lubrication system	0	0	.59	0	0	.15	0	0	0	0	0	0	0	0	.47	0	0	.12
Engine structure	9.08	4.24	3.57	0	6.45	4.59	2.28	0	9.11	0	0	3.29	7.39	3.59	4.72	0	5.88	4.36
Propeller assembly	3.03	0	0	0	0	.58	0	0	0	0	0	0	2.27	0	0	0	0	.48
Engine control system	0	3.03	0	0	0	.58	0	0	0	0	0	0	0	2.56	0	0	0	.48
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Undetermined	.31	0	.72	1.82	0	.58	0	16.72	0	0	0	2.63	.23	2.57	.57	1.50	0	.95
Total power plant failures	12.42	7.27	6.31	2.12	6.45	6.89	11.36	16.72	27.28	14.29	0	16.45	12.16	8.72	10.66	4.25	5.88	8.62
Structural:																		
Flight control system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Movable surfaces	1.52	0	0	0	0	.29	0	0	0	0	0	0	1.14	0	0	0	0	.23
Stabilizing surfaces	1.52	0	0	0	0	.29	0	0	0	0	0	0	1.14	0	0	0	0	.23
Wings, struts and bracings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Undercarriage	0	3.04	9.51	6.06	3.22	4.65	9.08	0	0	0	0	2.63	2.27	2.57	7.54	5.00	2.94	4.29
Retractable landing gear mechanism	6.07	0	2.38	9.09	.33	3.55	9.08	16.64	0	0	0	5.26	6.82	2.56	1.89	7.50	.30	3.86
Wheels, Tires and brakes	6.05	3.02	5.72	1.82	.97	3.66	0	0	9.11	0	0	2.63	4.54	2.56	6.42	1.50	.88	3.48
Pontoons or boats	0	0	0	0	0	0	0	16.64	0	0	0	2.63	0	2.56	0	0	0	.48
Fuselage, engine mounts and fittings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tail wheel assembly	3.03	0	0	0	6.45	1.75	0	0	0	0	0	0	2.27	0	0	0	5.88	1.43
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Undetermined	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total structural failures	18.19	6.06	17.61	16.97	10.97	14.19	18.16	33.28	9.11	0	0	13.15	18.18	10.25	15.85	14.00	10.00	14.00

Analysis of Causes of Accidents, 1938–1942—Continued

	Domestic						International and Territorial						Domestic, International and Territorial					
	1938	1939	1940	1941	1942	5-year average	1938	1939	1940	1941	1942	5-year average	1938	1939	1940	1941	1942	5-year average
Handling qualities	0	0	0	1.66	0	.32	0	0	0	8.57	0	1.58	0	0	0	2.87	0	.55
Instruments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total airplane failures	30.61	13.33	23.92	20.75	17.42	21.40	29.52	50.00	36.39	22.86	0	31.18	30.34	18.97	26.51	21.12	15.88	23.17
Miscellaneous:																		
Weather	18.63	8.64	11.79	9.24	11.78	12.01	0	0	12.72	1.43	33.33	6.58	13.97	7.31	11.98	7.88	13.68	11.02
Darkness	0	0	.95	0	.97	.41	0	0	0	0	0	0	0	0	.75	0	.88	.33
Airport, terrain or water	12.12	23.64	6.66	7.58	13.54	12.38	18.20	33.36	32.72	1.43	23.36	22.11	13.64	25.13	12.07	6.50	14.41	14.14
Other	0	12.12	3.57	3.64	12.26	6.10	18.20	0	0	14.28	0	7.90	4.55	10.26	2.83	5.50	11.18	6.43
Total miscellaneous causes	30.75	44.40	22.97	20.46	38.55	30.90	36.40	33.36	45.44	17.14	56.69	36.59	32.16	42.70	27.63	19.88	40.15	31.92
Undetermined and doubtful	0	0	0	3.03	3.22	1.16	18.16	0	0	0	0	5.26	4.54	0	0	2.50	2.94	1.91
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Vital Statistics, Results, and Analysis of Causes, January–June 1943

VITAL STATISTICS AND RESULTS [1]

	Domestic	International and Territorial	Total
Number of accidents:			
Involving fatal injury	0	3	3
Involving severe injury	1	0	1
Involving minor and no injury	13	2	15
Total accidents	14	5	19
I. Injury to personnel:			
Pilots:			
Fatal injury	0	2	2
Severe injury	0	0	0
Minor injury	1	1	2
Uninjured	13	2	15
Copilots:			
Fatal injury	0	3	3
Severe injury	0	0	0
Minor injury	0	0	0
Uninjured	11	2	13
Passengers:			
Fatal injury	0	39	39
Severe injury	0	3	3
Minor Injury	0	3	3
Uninjured	142	19	161
Aircraft crew:			
Fatal injury	0	13	13
Sever injury	1	4	5
Minor injury	0	2	2
Uninjured	12	2	14
Total injuries and noninjuries:			
Fatal injury	0	57	57
Severe injury	1	7	8
Minor injury	1	6	7
Uninjured	178	25	203
Total	180	95	275
II. Damage to material:			
Airplanes:			
Completely demolished	0	3	3
Complete overhaul	3	1	4
Major assembly	8	1	9
Minor repairs	2	0	2
No damage	1	0	1
III. Nature of accident:			
Collision (see definition)	0	0	0
Collision (see definition)	1	3	4
Spins or stalls (engine failure)	0	0	0
Spins or stalls (not engine failure)	0	0	0
Forced landings	3	0	3
Landing accidents	5	1	6
Take-off accidents	2	0	2
Taxying accidents	1	0	1
Fires in the air	0	1	1
Structural failure	0	0	0
Miscellaneous	2	0	2
Indeterminate and doubtful	0	0	0
Miscellaneous information:			
Fires after accident	0	2	[2] 2
Non-scheduled air-carrier accidents:			
Instructional	0	4	4
Charter	1	0	1
Total non-scheduled accidents	1	4	[3] 5

See footnotes at end of table.

Private Practice In Meteorology Foreseen by Burden

More job opportunities for meteorologists in private practice were predicted by Wm. A. M. Burden, special aviation assistant to the Secretary of Commerce, in a recent speech at the University of Chicago.

"Weather forecasting has largely consisted of general warnings to the public," he said. "For that reason the meteorological science has developed as a government function. General weather reporting requires an extensive network of observing stations covering oceans as well as continents. It takes an organization too large and too costly for private enterprise to maintain; like the postal service, it has had to be financed and developed by the Government as a service for the common welfare."

He pointed out, however, that the development of aviation is increasing the demand for specialized meteorological information. "The businessman and the corporation who can increase efficiency and reduce losses through use of more specialized information than that contained in forecasts for the general public will need to employ a company meteorologist for the purpose. They will want their individual interests kept constantly in mind so they can be advised whenever changes in weather will affect their operations. Many commercial air transport companies have already hired company meteorologists to look after their weather interests," he stated.

Burden named as the two main meteorological jobs of the post-war period, the maintenance and extension of the basic network of reporting stations for the use of the general public, and the specialized interpretation of weather maps for air transport operators, agriculturists, engineers, and other enterprises.

He predicted that an increased number of meteorologists would be employed by private industry and the Government in furtherance of these jobs.

Vital Statistics, Results, and Analysis of Causes, January–June 1943—Continued

ANALYSIS OF CAUSES

	Domestic	International and Territorial	Total
Number of accidents involved	14	5	19
CAUSES (ALL FIGURES PERCENT OF TOTAL)			
Personnel:			
Pilots:			
Error of judgment	8.16	6.58	14.74
Poor technique	4.74	5.26	10.00
Disobedience of orders or regulations	0	0	0
Carelessness or negligence	5.26	0	5.26
Miscellaneous	0	0	0
Total pilot errors	18.16	11.84	30.00
Other personnel	6.32	2.37	8.69
Total personnel errors	24.48	14.21	38.69
Material:			
Power plant:			
Fuel system	0	0	0
Cooling system	0	0	0
Ignition system	0	0	0
Lubrication system	0	0	0
Engine structure	14.74	5.26	20.00
Propeller assembly	0	0	0
Engine-control system	0	0	0
Miscellaneous	0	0	0
Undetermined	0	0	0
Total power plant failure	14.74	5.26	20.00
Structural:			
Flight-control system	0	0	0
Movable surfaces	0	0	0
Stabilizing surfaces	0	0	0
Wings, struts, and bracings	0	0	0
Undercarriage	3.16	5.26	8.42
Retractable landing-gear mechanism	5.26	0	5.26
Wheels, tires, and brakes	1.58	0	1.58
Pontoons or boats	0	0	0
Fuselage, engine mount, and fittings	0	0	0
Tail-wheel assembly	0	0	0
Miscellaneous	0	0	0
Undetermined	0	0	0
Total structural failures	10.00	5.26	15.26
Handling qualities	0	0	0
Instruments	0	0	0
Total airplane failures	24.74	10.52	35.26
Miscellaneous:			
Weather	8.68	1.58	10.26
Darkness	0	0	0
Airport, terrain, or water	5.26	0	5.26
Other	10.53	0	10.53
Total miscellaneous causes	24.47	1.58	26.05
Undetermined and doubtful	0	0	0
Total	73.69	26.31	100.00

[1] These statistics were prepared on the basis of N. A. C. A. definitions contained in Report No. 576 "Aircraft Accidents—Method of Analysis," 1941. The same definitions were applied when these data appeared in volume 2, No. 12 of the Civil Aeronautics Journal.

[2] This figure covers the number of fires occurring after accident. The results are included in the above regular aircraft accident statistics under Groups I, II, and III.

[3] Pilots 1 fatal injury, 1 minor injury, 3 uninjured; copilot 1 uninjured; co-pilot trainees, 2 fatal injuries, 2 minor injuries, and 2 uninjured. These accidents are not included in the above statistics under Groups I, II, and III, but will be included in the Private Flying statistics for this period.

New Aircraft Parts

The CAA has approved new models of already certificated propellers, safety belts and wheels. Data on these approvals follow:

Propellers.—G. B. Lewis; L44–1 and L44–2; wood; 71-inch and 70-inch diameter, respectively; 50-inch to 40-inch pitch; 75 hp.; 2,600 r. p. m. (Type Certificate No. 797, September 20, 1943.)

Propellers.—G. B. Lewis; L30, L30–1 and L30–2; wood; 70-inch, 69-inch, and 68-inch diameter, respectively; 53-inch to 43-inch pitch; 50 hp.; 2,300 r. p. m. (Type Certificate No. 788; September 2, 1943.)

Propellers.—U. S.; 76FGSA; wood; 76-inch diameter; 64-inch pitch; 115 hp.; 2,200 r. p. m. (Type Certificate No. 787; September 7, 1943.)

Department of Air

A bill has been introduced into Congress to establish a Department of Air Defense, with the United States Air Forces established as a separate branch of national defense.

Safety belt.—Pan American Airways; model 12.134.340C; approved for one person. (Type Certificate No. 104; September 2, 1943.)

Safety belt.—Eastern Airlines; model M–20302; approved for one person. (Type Certificate No. 139; September 2, 1943.)

Low pressure wheels.—Goodyear; model L10HBM, 7.50–10; approved static load per wheels 2,800 pounds. (Type Certificate No. 37; September 28, 1943.)

National Airport Has Unique Crash Boat

Air power is used at the Washington National Airport to drive a shallow-water crash boat for use in the shallows of the Potomac near the field.

Workmen Richard Collins, William R. Hobbs, Jack Turner, Gardner Rodgers, and Tom Flaherty have built the "Toiler," a 12-foot scow with a 6-foot beam, driven by an air propeller on a Lycoming 40-hp. engine. It can traverse most of the area around the field even at low tide, and needs only 4 inches of water. The rudder is hinged to ride over logs, mud flats, and sand spits.

All parts of the boat were made of salvaged material around the airport, and all the work was done in the airport shops.

CAB—on Pre-CAA Act Control Relationships

A control relationship between ground and air carriers which existed before the Civil Aeronautics Act of 1938 is not within the jurisdiction of the Civil Aeronautics Board, according to a recent stand taken by the Board.

In dismissing the applications of Boston & Maine and Maine Central railroads for approval of control of Northeast Airlines, the Board stated, "While we do not believe that Congress intended us to exercise jurisdiction over a control relationship created prior to the effective date of the Civil Aeronautics Act and existing unchanged from that date forward, we do believe that we possess jurisdiction in cases where the extent or effect of such control has increased."

New Executive Assistant To Board Chairman

J. Francis Reilly has been appointed executive assistant to CAB Chairman L. Welch Pogue, filling the position vacated by the resignation of Robert B. Bias who has accepted an executive position in the Washington office of the Lockheed Aircraft Corporation of California.

Reilly, as a CAB examiner, has presided over many of the most important international and domestic hearings and is well known in the air transport industry. A Pennsylvanian by birth, he practiced law in Washington, D. C., prior to becoming assistant corporation counsel for the District of Columbia, which position he left to join the Civil Aeronautics Board in 1940.

33,378 Miles of Airways

The Federal Airways Service is responsible for the establishment, maintenance, and operation of the Federal Airways System which now consists of 33,378 miles of routes equipped with radio ranges, radio communications stations, teletype circuits, intermediate landing fields, and beacon lights.

Orders

ORDER No. 2424——— *September 1, 1943*
Authorized Transcontinental & Western Air., Inc., to engage in air transportation (persons and property only) to and from Palm Springs, Calif., as an additional intermediate point on Route 2. Transportation is limited to members of the armed forces of the United States and of the Allied Nations.

ORDER No. 2425——— *September 1, 1943*
Revoked student pilot certificate held by Merrill John Osborn for certain violations of the Civil Air Regulations.

ORDER No. 2426——— *September 1, 1943*
Temporarily suspended student pilot certificate held by Cameron MacKenzie Ross, Jr., for certain violations of the Civil Air Regulations.

ORDER No. 2427——— *September 1, 1943*
Denied petition of Pennsylvania-Central Airlines Corporation for reconsideration of Order No. 2414 re. service between Washington, D. C., and Boston, Mass.

ORDER No. 2428——— *September 1, 1943*
Severed application of New England Airlines, Inc. (formerly TWA-New England, Inc.) from the consolidated hearing September 8 of seven airlines for New England routes, postponed the hearing indefinitely, and granted leave to intervene in the consolidated proceeding.

ORDER No. 2429——— *September 2, 1943*
Approved agreement between American Airlines, Inc., and American Airlines de Mexico, S. A., relating to the purchase and use of airway and ground facilities and employment and use of personnel in the Republic of Mexico.

ORDER No. 2430——— *September 2, 1943*
Approved agreement (contract CAB 256) between 16 major airlines relating to Air Cargo, Inc.

ORDER No. 2431——— *September 2, 1943*
Denied motion of Northeast Airlines to intervene in the matter of the applications of Boston and Maine Railroad and Maine Central Railroad Co.

ORDER No. 2432——— *September 3, 1943*
Approved agreements by and between certain airlines relating to standard interline reservations procedure. (CAB contracts 245 and 245A.)

ORDER No. 2433——— *September 6, 1943*
Authorized inauguration of service by Transcontinental & Western Air, Inc., to and from Los Angeles, Calif. (Route 37), pursuant to Order 2409.

ORDER No. 2434——— *September 8, 1943*
Revoked airline transport pilot certificate held by E. E. Basham, Sr., for certain violations of the Civil Air Regulations. (Opinion and Order.)

ORDER No. 2435——— *September 8, 1943*
Severed and dismissed application of Transcontinental & Western Air, Inc., for approval of control of TWA-New England, Inc., under Sec. 408 of the Civil Aeronautics Act of 1938, Docket 908.

ORDER No. 2436——— *September 8, 1943*
Denied petition of Pennsylvania-Central Airlines Corporation requesting oral argument before the Board on the consolidation of Docket 979 with the consolidated proceeding in Docket 13-401-B-1, et al.

ORDER No. 2437——— *September 13, 1943*
Revoked student pilot certificate of Ruby Roark Nance for certain violations of the Civil Air Regulations.

ORDER No. 2438——— *September 13, 1943*
Denied request for reinstatement of commercial pilot certificate held by Clifton Smith Stovall.

ORDER No. 2439——— *September 13, 1943*
Amended Order No. 2388 to revoke commercial pilot certificate held by James Albert D'Ostroph.

ORDER No. 2440——— *September 13, 1943*
Amended certificate of Eastern Air lines to include Raleigh, N. C., as an alternate intermediate point to Greensboro, N. C., and Columbia, S. C., as an alternate intermediate point to Charleston, S. C.; consolidated applications of Eastern Air Lines, Inc., and Pennsylvania-Central Airlines Corporation, with Docket 569; deferred action on the applications of Colonial Airlines, Inc., Eastern Air Lines, Inc., National Airlines, Inc., Seaboard Airways, Inc., and Pennsylvania-Central Airlines Corporation.

ORDER No. 2441——— *September 14, 1943*
Amended Order No. 2136 to extend to October 25, 1944, the date on which American Export Airlines, Inc., and American Export Lines must submit their divestment plan to the Board.

ORDER No. 2442——— *September 17, 1943*
Authorized Eastern Air Lines to suspend service to Baton Rouge, La., until October 28, 1943.

ORDER No. 2443——— *September 17, 1943*
Consolidated into one hearing applications of TWA, Braniff and Continental for stops in several Kansas cities.

ORDER No. 2444——— *September 18, 1943*
Granted TWA nonstop service between Las Vegas, Nev., and Winslow, Ariz., omitting Boulder City airport.

ORDER No. 2445——— *September 22, 1943*
Suspended commercial pilot certificate of Francis C. Bethell, pending further hearing.

ORDER No. 2446——— *September 21, 1943*
Dismissed Pan American Airways applications for 300 shares or 40 percent of Aerovias de Guatemala, S. A.

ORDER No. 2447——— *September 22, 1943*
Issued student pilot certificate to Ellis C. MacDonough after request for reconsideration.

ORDER No. 2448——— *September 23, 1943*
Denied without prejudice Pan American-Grace Airways motion to dismiss proceedings.

ORDER No. 2449——— *September 24, 1943*
Suspended private pilot certificate of Warren Curtiss Brown for 6 months.

ORDER No. 2450——— *September 17, 1943*
Approved United Air Lines Transport Corporation's acquisition for control of Lineas Aereas Mineras, S. A.

ORDER No. 2451——— *September 25, 1943*
Consolidated into one hearing applications of Pennsylvania-Central Airlines for an unnumbered route between Pittsburgh and Baltimore and for Route 14, Dockets Nos. 398 and 599.

ORDER No. 2452——— *September 13, 1943*
Denied request of Eastern Air Lines that certain Central American route applications be consolidated with the Board proceeding to determine whether the Pan American-Grace Airways certificate should be altered, amended, and modified.

Regulations

REGULATION No. 286— *September 11, 1943*

Effective October 11, 1943.

SECTION 251.2 OF THE ECONOMIC REGULATIONS—AGREEMENTS BETWEEN AIR CARRIERS AND FOREIGN COUNTRIES

(*a*) *Filing required.*—Every air carrier shall file with the Board true and complete evidence, as hereinafter specified, of each agreement in any way affecting or involving operating rights and in force on the effective date of this regulation or thereafter issued or entered into as between such air carrier, or any officer or representative thereof, and any foreign country or political subdivision thereof, or any department, agency, officer, or representative of such country or subdivision. For the purposes of this regulation, the term "agreement" means and includes any permit, concession, franchise, contract, understanding, or arrangement, and also any amendment, modification, renewal, rescission, or revocation of any thereof.

(*b*) *Evidence of agreement.*—The evidence of such agreement shall be as follows:

(1) If written in English, three copies thereof;
(2) If written in a foreign language, three copies and three translations thereof;
(3) If oral, three copies of a descriptive memorandum thereof; or
(4) if evidenced by correspondence only, three copies of such correspondence and, if such correspondence, in whole or in part, is written in a foreign language, three translations of the part that is so written.

In any case where translations are required, the copies to be filed shall be copies of official translations if official translations have been made.

(*c*) *Form.*—Evidence of agreements filed hereunder shall meet, insofar as possible, the requirements set forth in section 285.3 of the Economic Regulations as to verification and formal specifications of papers.

(*d*) *Time of filing.*—Such evidence shall be filed within 60 days after such agreement has been issued or entered into, except that agreements which have been issued or entered into prior to the effective date of this regulation shall be filed within 60 days after such effective date.

AMENDMENT 61-12— *September 8, 1943*

Effective November 8, 1943, § 61.7211 of the Civil Air Regulations is revoked.

NOTE: *The take-off provided for by this section is no longer permitted. See § 61.23.*

STATUS OF AIR REGULATIONS

Regulations as of October 1, 1943

HOW TO OBTAIN PARTS, AMENDMENTS, AND MANUALS

THOSE PARTS AND MANUALS ON WHICH A PRICE IS LISTED IN THE TABULATION WHICH FOLLOWS ARE ON SALE AT THE GOVERNMENT PRINTING OFFICE (SHOWN AS GPO IN TABLE), AND ARE NOT AVAILABLE FOR FREE DISTRIBUTION FROM THE CAA.

The Government Printing Office is the official sales agency for all government publications and is separate and distinct from the CAA and the Department of Commerce. The rules of the Superintendent of Documents require that *remittances be made in advance* of shipment of publications, either by coupons, sold in sets of 20 for $1 and good until used, or by check or money order payable to the *Superintendent of Documents, Government Printing Office.* Currency is sent at sender's risk. Postage stamps, foreign money, and smooth coins are not acceptable. A discount of 25 percent is allowable to book dealers and quantity purchasers of 100 or more publications, on condition that the purchasers will adhere to the public sales price set by the Superintendent of Documents and that publications shall not be overprinted with any advertising matter.

Eventually, all Parts and Manuals will be placed on sale; meanwhile, those not yet on sale (carrying remark, "Order from CAA only") may be obtained without charge from the CAA upon demonstration of valid interest on the applicant's part.

The following tabulation carries in the right-hand column the numbers of all effective amendments to each Part and Manual issued subsequent to its publication. Parts and Manuals obtained from the CAA will include all effective amendments, but amendments for Parts and Manuals purchased from GPO must be requested separately from the CAA. When requesting amendments from the CAA, please be sure to state Part numbers for which they are desired.

ALL AMENDMENTS TO THE REGULATIONS, AND NOTICE OF NEW PARTS AND MANUALS ARE PRINTED IN THE CIVIL AERONAUTICS JOURNAL, AS RELEASED.

Bound volumes of the complete Civil Air Regulations are no longer available. Parts and amendments are punched for filing in standard three-ring binders.

For your guidance we have listed the Parts and Manuals applicable to the various airmen certificates issued.

Pilots:
Parts 01, 20, 60, 501, 503, and Manual 60.
Airline Transport Pilots:
Parts 01, 04, 21, 27, 40, 60, 61, 98, 501, 503, and Manuals 04 and 60.
Lighter-Than-Air Pilots:
Parts 01, 22, 60, 501, 503, and Manual 60.
Aircraft Mechanics:
Parts 01, 04, 15, 18, 24, 501, 503, section 60.32, and Manuals 04, 15, and 18.
Aircraft Engine Mechanics:
Parts 01, 04, 13, 14, 18, 24, 501, 503, and Manuals 04, 14, and 18.
Parachute Technicians:
Parts 15, 25, 54, 60, and Release 144.
Air-Traffic Control-Tower Operators:
Parts 26, 60, and Manual 60.
Aircraft Dispatchers:
Parts 27, 40, 60, 61, and Manual 60.
Ground Instructors (rating in Civil Air Regulations):
Parts 01, 20, 51, 60, 501, 503, and Manual 60.

PARTS CANCELED AND UNASSIGNED

Canceled Parts 00 and 03 now incorporated in Part 501; canceled Part 23 now incorporated in Part 51. Parts 90–96, inclusive, canceled. All other Part numbers not shown are unassigned.

Civil Air Regulations

Aircraft

Part No.	Title	Date	Remarks	Price	Effective Amendments
01	Airworthiness Certificates	10-15-42	On sale at GPO	$0.05	
02	Type and Production Certificates	3-1-41	On sale at GPO	.05	
04	Airplane Airworthiness	8-15-42	On sale at GPO	.15	04-1, Reg. Ser. 228.
13	Aircraft Engine Airworthiness	8-1-41	On sale at GPO	.05	
14	Aircraft Propeller Airworthiness	7-15-42	On sale at GPO	.05	
15	Aircraft Equipment Airworthiness	11-15-40	In stock; order from CAA only	------	15-1, 15-2.
16	Aircraft Radio Equipment Airworthiness	2-13-41	On sale at GPO	.05	
18	Maintenance, Repair, and Alteration of Certificated Aircraft and of Aircraft Engines, Propellers, and Instruments.	9-1-42	On sale at GPO	.05	

Airmen

20	Pilot Certificates	9-1-42	On sale at GPO	$0.10	20-1, thru 20-5, Reg. Ser. 242, 247.
21	Airline Transport Pilot Rating	10-1-42	On sale at GPO	.05	21-1, thru 21-3, Reg. Ser. 278
22	Lighter-Than-Air Pilot Certificates	10-15-42	On sale at GPO	.05	Reg. Ser. 247.
24	Mechanic Certificates	7-1-43	On sale at GPO	.05	
25	Parachute Technician Certificates	1-21-43	In stock; order from CAA only	------	25-1.
26	Air-Traffic Control-Tower Operator Certificates.	7-1-42	On sale at GPO	.05	26-1, 26-2.
27	Aircraft Dispatcher Certificates	9-1-42	On sale at GPO	.05	27-1.
29	Physical Standards for Airmen	6-1-42	On sale at GPO	.05	

Air Carriers

40	Air Carrier Operating Certification	11-1-42	On sale at GPO	$0.10	40-1, 40-2.

Air Agencies

50	Flying School Rating	11-1-40	On sale at GPO	$0.05	87, 113, 50-3, Reg. No. 216.[1]
51	Ground Instructor Rating	7-1-42	On sale at GPO	.05	
52	Repair Station Rating	10-1-42	On sale at GPO	.05	
53	Mechanic School Rating	8-1-42	On sale at GPO	.05	
54	Parachute Loft Certificates and Ratings	1-21-43	In stock; order from CAA only	------	

Air Navigation

60	Air-Traffic Rules	7-1-43	On sale at GPO	$0.10	60-1 thru 60-3.
61	Scheduled Air-Carrier Rules	10-15-42	On sale at GPO	.10	61-1 thru 61-12.
66	Foreign Air-Carrier Regulations	1-15-42	On sale at GPO	.05	

Miscellaneous

97	Rules of Practice Governing Suspension and Revocation Proceedings.	10-1-42	In stock; order from CAA only	------	
98	Definitions	10-15-42	On sale at GPO	$0.05	
99	Mode of Citation of Regulations	11-15-40	In stock; order from CAA only	------	

[1] No copies available. (Waiver of requirements.) Consult CAA inspector for specific provisions of this amendment.

Regulations of the Administrator

Part No.	Title	Date	Remarks	Price	Effective Amendments
501	Aircraft Registration Certificates	3-31-43	In stock; order from CAA only		
503	Recordation of Aircraft Ownership	3-31-43	In stock; order from CAA only		
510	General Regulations, Washington National Airport.	9-26-41	In stock; order from CAA only		
511	General Aeronautical Rules for the Washington National Airport.	9-26-41	In stock; order from CAA only		
525	Notice of Construction or Alteration of Structures on or Near Civil Airways.	7-23-43	In stock; order from CAA only		
531	Seizure of Aircraft	12-8-41	In stock; order from CAA only		
532	Reproduction and Dissemination of Current Examination Materials.	1-15-43	In stock; order from CAA only		
600	Designation of Civil Airways	3-1-42	Not published [1]		1 through 28.[1]
601	Designation of Airway Traffic Control Areas, etc.	1-15-42	Not published [1]		1 through 42.[1]

Civil Aeronautics Manuals

04	Airplane Airworthiness	2-1-41	On sale at GPO	$0.50	Release 50, 97,[2] 105,[2] 117,[2] 140.[2]
14	Aircraft Propeller Airworthiness	12-1-38	In stock; order from CAA only		
15	Aircraft Equipment Airworthiness	7-1-38	On sale at GPO	.10	
16	Aircraft Radio Equipment Airworthiness	2-13-41	In stock; order from CAA only		Release 62.
18	Maintenance, Repair, and Alteration of Certificated Aircraft and of Aircraft Engines, Propellers, and Instruments.	6-1-41	On sale at GPO	.50	
50	Flying School Rating	12-40	In stock; order from CAA only		Release 77, 111.
52	Repair Station Rating	2-41	In stock; order from CAA only		
53	Mechanic School Rating	5-40	In stock; order from CAA only		
60	Air Traffic Rules	8-1-43	On sale at GPO	.15	

[1] *See Air Navigation Radio Aids.*
[2] *Only pertinent pages furnished.*

Average Man Air Service

(Continued from page 130)

should be the aim of postal policy to transmit every letter by air without surcharge, whenever delivery can be advanced thereby. Not only the most critical papers and documents but all first-class postal material should have the advantage offered by the speed of air transport.

From the preceding statements it is clear that a number of different types of air service will have to be provided. Operating units will have to specialize in the various kinds of service if high standards of efficiency and service are to be attained.

A prerequisite for high standards of performance is an organization of stops into routes so that the traffic demands and potentials will be as uniform as possible along each route. This would permit the selection of the most appropriate equipment, schedules, and other service factors. In addition, it would be possible to minimize the costs of airport and other ground facilities.

Setup of Routes

Furthermore, adequate safeguards for the proper development of a route established for a particular type of traffic would seem to require a designation of the services to be offered on each route. This would require a small change in the manner in which routes have previously been set up under certificates of convenience and necessity. A certificate would contain, in addition to a designation of stops and other conditions, a designation of the class or classes of service to be provided. For example, if a route were established to provide long-distance service between a few major cities the certificate should so specify. If a route were established to provide service between a string of small cities and a large center, the certificate should so specify.

Something like a three-way classification of services is suggested. First, there would be the major transcontinental services, North and South as well as East and West. Examples are the through services of TWA, United, American, Eastern, and Chicago and Southern.

In a second class would be placed services designed for smaller cities lying between large cities. For example, in addition to Chicago & Southern's through route servicing Chicago, St. Louis, Memphis, and New Orleans, there would be another service between those same cities but serving also Peoria, Springfield, Paducah, Vicksburg, Natchez, and Baton Rouge. Thus, also, a route between St. Louis and New Orleans might be designed to serve such places as Baton Rouge, Natchez, Vicksburg, Arkansas City, and Cairo.

The third class of service might be designed to serve one or more series of small cities extending spoke-wise from a large city, with no large terminal city at the far end of the series. Such a service would be adaptable to the small places west of Denver to Grand Junction, and similarly from Grand Junction to Pueblo.

With expansion of air transport, the development of airport, airway, and related facilities will have to proceed apace. These facilities are critical. To obtain some idea of the kind of job before us the CAA has studied the quantity and cost of the necessary facilities. And one of the most striking results of this study has been the revelation of the relatively small number of stops required to obtain a very high population and geographic coverage. This is the consequence of the manner in which our people have become "bunched up" into fairly large groups.

In an analysis made by Martin Taitel, CAA Economic Consultant, it was revealed that of our 1940 population of 132,000,000, almost 48 percent are bunched up into 140 metropolitan areas of 50,000 or more. Thus, if we disregard the possibility of multiple air stations at the very large places, 140 airports could serve almost half the population.

460 More Airports

To obtain a very high population coverage (about 90 percent of the urban population) smaller cities should have direct service or be within 15 highway miles of an airport. About 460 additional airports would do this job.

For very complete population and geographical coverage about 850 air stations are required. Thus less than 600 new stops would be needed since 273 already are authorized.

The cost of improving existing airports and constructing new ones where necessary would run around $215,000,000. To install the necessary additional radio ranges, weather reporting and communication equipment, and airport control towers, would cost an additional $12,000,000. The total of the construction and installation costs would be about $227,000,000. Certainly, this is a moderate cost to pay for the facilities needed to provide an adequate air transport system.

Instrument Flying

Instrument Flight, a 155 page study on basic instrument work originating in the Naval Bureau of Aeronautics, is on sale at the Superintendent of Documents, Government Printing Office, Washington, D. C., for 35 cents a copy.

INCREASES IN AIRCRAFT, PILOTS & STUDENT PILOTS

	JULY 1, 1939	JULY 1, 1943	PERCENTAGE INCREASE
CERTIFICATED AIRCRAFT	11,100	22,011	97%
CERTIFICATED PILOTS	26,144	101,075	287%
STUDENT PILOTS	34,901	159,403	356%